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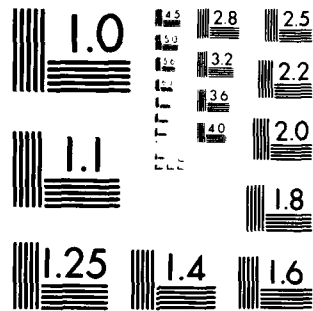
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**CORPS MOBILIZATION
CAPABILITIES, REQUIREMENTS,
AND PLANNING**

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**Prepared by
US Army Engineer Studies Center
Corps of Engineers**

March 1980

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Capabilities	Full Mobilization									
Requirements	Total Mobilization									
Planning	Nuclear Attack									
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) <p>This monograph assesses Corps of Engineers capabilities for meeting their requirements in conventional, full, and total mobilization, and in a nuclear attack situation. The report also quantifies insofar as possible Corps requirements under these mobilization conditions, and discusses the internal actions the Corps should implement so as to meet these requirements.</p>										

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**CORPS MOBILIZATION CAPABILITIES,
REQUIREMENTS, AND PLANNING**

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the objectives of the Corps of Engineers Mobilization
Support Study.

Prepared by
US Army Engineer Studies Center
Corps of Engineers

March 1980

CONTENTS

<u>Section</u>		<u>Page</u>
	ACKNOWLEDGMENTS	iii
	CONTENTS	v
	ABSTRACT	vii
I	INTRODUCTION	
	Purpose	1
	Scope	2
	Background	3
II	PERSONNEL RESOURCES	
	General	13
	Peacetime Strengths	13
	Full Mobilization Strengths	16
	Total Mobilization (Conventional)	31
	Total Mobilization (Nuclear)	32
	Overview	39
III	MOBILIZATION REQUIREMENTS	
	General	41
	Full Mobilization Requirements	41
	Total Mobilization (Conventional) Requirements	59
	Total Mobilization (Nuclear) Requirements	64
IV	PLANNING FOR MOBILIZATION	
	General	67
	Planning Requirements and Concepts	67
	Summary	71
V	SUMMARY	
	Overview	73
 <u>Figure</u>		
1	Emergency Powers Summary	5
2	Construction Demands and Gross National Product: 1916-1980	7
3	Corps Peacetime Personnel Strength	14
4	Peacetime--Mobilization Mission and Function Shifts	17
5	Factors Impacting on Corps CONUS Mobilization Strength	18
6	Civil Functions and Associated Percentages of Available Personnel	20

<u>Figure</u>		<u>Page</u>
7	Tentative Officer Augmentations for Europe	21
8	Mobilization Posts Requiring Garrisons	25
9	Corps Mobilization Designees	28
10	Corps Post-strike Residual Work Force	35
11	Army Full Mobilization Installations	44
12	Fort Campbell: Manpower Loading During Mobilization	46
13	Installation Mobilization Personnel Loading and Limitations	47
14	Housing Assets of Selected Mobilization Posts	49
15	Primary Army-owned Production Base Facilities	53
ANNEX A--HISTORICAL REVIEW OF CORPS CONSTRUCTION SUPPORT TO THE MILITARY		A-1
ANNEX B--CORPS PERSONNEL AND FUNCTIONS		B-1
ANNEX C--IMPACT OF CIVIL DEFENSE SUPPORT ON MOBILIZATION PLANNING		C-1
APPENDIX C-1--DIRECTIVES FOR POSTATTACK EMPLOYMENT OF CONSTRUCTION RESOURCES STUDY BY THE OFFICE OF CIVIL DEFENSE, CHIEF OF STAFF ARMY, MAY 1969		C-1-1
ANNEX D--INSTALLATION-PRODUCTION BASE MOBILIZATION REQUIREMENTS		D-1
ANNEX E--CONCEPTS FOR MOBILIZATION PLANNING		E-1
ANNEX F--BIBLIOGRAPHY		F-1

ABSTRACT

This monograph provides a qualitative and, to the extent possible, quantitative assessment of Corps of Engineers capabilities for meeting mobilization requirements, and the planning required for Corps mobilization efforts. The monograph discusses the Corps' historical involvement in previous national mobilization efforts and what should be expected in a future mobilization. Three levels of mobilization are considered: full, total (conventional), and total (nuclear). Corps capabilities during these mobilizations can be fairly accurately determined. However, the workload is vague at present because Corps customers have to provide specificity on many mobilization requirements, and some requirements are in a state of flux as new manpower stationing loads are being computed. The Corps needs to take certain internal actions now to ensure that its concepts, plans, and skills are adequate to meet mobilization requirements when they occur.

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CORPS MOBILIZATION CAPABILITIES, REQUIREMENTS, AND PLANNING

I. INTRODUCTION

Construction is not only the biggest single part of defense, it is the first step in defense.

Sidney Hillman^{1/}

1. Purpose. This monograph describes the magnitude and character of the Corps of Engineers' efforts necessary to support national defense mobilization and to provide a concept for Corps mobilization planning for the 1980's. The conclusion reached by the Truman Commission quoted above is nearly forgotten and must be revived. Both the Army Chief of Staff and the Chief of Engineers have repeatedly stressed the necessity for a rapid response to mobilization by all Army elements. Such a response, measured in hours or days, is necessitated by current military technology and quick troop deployment to meet a sudden enemy threat. In much of the Army's planning, the assumption is made that the initiation of hostilities, commencement of deployments, and mobilization occur on the same day.^{2/} There has been a general failure to recognize the importance of construction in mobilization planning. The lessons of previous mobilizations need reviving. Current mobilization planning has become obsessed with the preeminent importance of manpower; and as this obsession grows, other vital factors of mobilization support ebb in importance. To some degree, production base problems are considered in defense plans, but planning and posturing for the surge in construction which must precede a production base and manpower surge are nearly forgotten. This consideration must be championed by Corps planners if the Army is to respond adequately to national

^{1/} Congress of the US, 77th Congress, 1st Session, Truman Commission Hearings.

^{2/} DA, USAFORSCOM, HQ, Reserve Component Mobilization Plan.

defense needs. Therefore, the highest priority for Corps planners is to develop the Corps plans incorporating construction needs and other Corps support. A final monograph will set forth the study conclusions and recommended actions and initiatives the Corps should take to enhance its responsiveness to military and national mobilization needs.

2. Scope.

a. This is the second monograph on Corps mobilization. The first monograph^{3/} described qualitatively the mobilization environments that Corps planners should anticipate for the 1980's. This monograph quantifies Corps capabilities and requirements to the extent possible within the continental United States (CONUS) for a spectrum of mobilization conditions. Because there is a vital need for immediate Corps response on a declaration of mobilization, Corps planners must make their plans as specific as possible. This monograph presents basic data and a conceptual framework for this detailed planning. This foundation is required so that more specifics can be developed by individual division and district planners working with military installation and major Army commands' (MACOMs) commanders and with civil defense (CD) planners. The third monograph^{4/} focuses on the Corps' current posture to meet mobilization requirements and recommendations for improving the Corps' response capability. To assess Corps capabilities and requirements, it is necessary to consider each of the three mobilization conditions.

- (1) Full mobilization, conventional short war.
- (2) Total mobilization, conventional long war.
- (3) Total mobilization, nuclear.

^{3/} DA, USAESC, Mobilization Environments.

^{4/} DA, USAESC, Corps Mobilization Posture.

b. Corps capabilities and requirements are presented in the first two sections of this monograph. A concept of mobilization planning is presented in the third section. Also included in this monograph are annexes that address in more detail some aspects of mobilization of which Corps planners must be more aware to understand the conditions with which they must be prepared to cope.

3. Background. A mobilization day interposes a complete discontinuity in the normal peacetime process of the nation. To properly view the magnitude and character of the construction mission that mobilization involves, it is necessary to discuss the general setting and historical lessons of mobilization.

a. General setting. Viewing wartime planning from the perspective of peace must be avoided. Mobilization is a wartime process. Mobilization for the conduct of war or during recovery from surprise attack involves values and procedures that may not, and probably do not, exist in peace. For instance, the profit motive, applauded in our society in peace, becomes profiteering in war; patriotism that may be ridiculed in peace becomes a wartime virtue; individual, state, and regional interests yield to Federal interests in wartime. Even the traditional checks and balances in government become weighted in favor of the Executive in wartime. The laws of the land recognize these revised value systems in many of the national statutes. In time of war, for example, the President may order necessary products to be manufactured at private plants and may even take over such plants if the orders are refused (US Code, Title 10, Sections 4501 and 9501). There are other actions possible for the President or military to take in wartime, or in preparation for war, that would be illegal in peacetime. They are contracting

for supplies and services without competitive bidding or advertising (US Code, Title 10, Section 2304); taking over and using property immediately on filing a petition of condemnation (US Code, Title 10, Section 2663); and purchasing for the armed forces clothing, subsistence, fuel, quarters, transportation, and other supplies for a current year without a Congressional appropriation (US Code, Title 41, Section 11). These are examples of the extraordinary powers that may be invoked by the President under Public Law 94-412 (US Code, Title 50, Section 1601). The judicious use of such powers must be planned for at all levels. Therefore, Corps planners must think in these terms when developing the plans enabling the Corps to respond immediately to national mobilization requirements. Figure 1 is a summary of those parts of the US Code most pertinent to mobilization support. The important point is that the nation has been through this before. The lessons have been debated and are recorded in law. The planner must first understand the war environment and then backward plan the transition of peace to war from the war side of the discontinuity.

b. Historical lessons. Changes in technology and the national and world environments make analogies between the past and future imprecise. Nonetheless, reference to previous experience in war and preparation for war can provide a perspective valuable in solving current problems. Annex A provides a brief review of Corps efforts from World War I through Vietnam. Pertinent lessons are summarized below.

(1) Total mobilization requires a large construction investment in facilities to enhance peacetime capacities. Of special significance is the rapid shift of workload from peacetime civil works (CW) to military construction (MC) during mobilization. Figure 2 shows the shifts that have occurred

EMERGENCY POWERS SUMMARY
(US Code)

Title No.	Section	Summary
5	3326	Permits the appointment of retired members of the Armed Forces to positions in the Department of Defense (DOD) when a state of national emergency exists.
5	7902 and implementing Federal regulations	Permits waivers of national safety standards and procedures.
10	2231, 2233	The Secretary of Defense (SECDEF) is authorized to acquire and expand facilities necessary for use of Reserve components in time of war or national emergency.
10	2304	Permits contracts for supplies and services to be negotiated without advertising if determined to be necessary in the public interest "during a national emergency declared by Congress or the President."
10	2663, 2664	The Secretary of a military department may "in time of war or when war is imminent," take and use property, including property for lumber production, immediately upon filing of petition for condemnation.
10	4501, 4502, 9501, 9502	"In time of war or when war is imminent" the President may order necessary products to be manufactured at private plants or take over such plants upon refusal to comply with such orders; and maintain lists of plants capable of war production.
10	4742, 9742	Relates to Presidential control of transportation systems "in time of war."
10	4776, 9776	If in "an emergency" the President considers it urgent, a temporary air base, fort, or fortifications may be built on private land if the owner consents in writing.
10	4780	Relates to acquisition of buildings in the District of Columbia in time of war or when war is imminent.

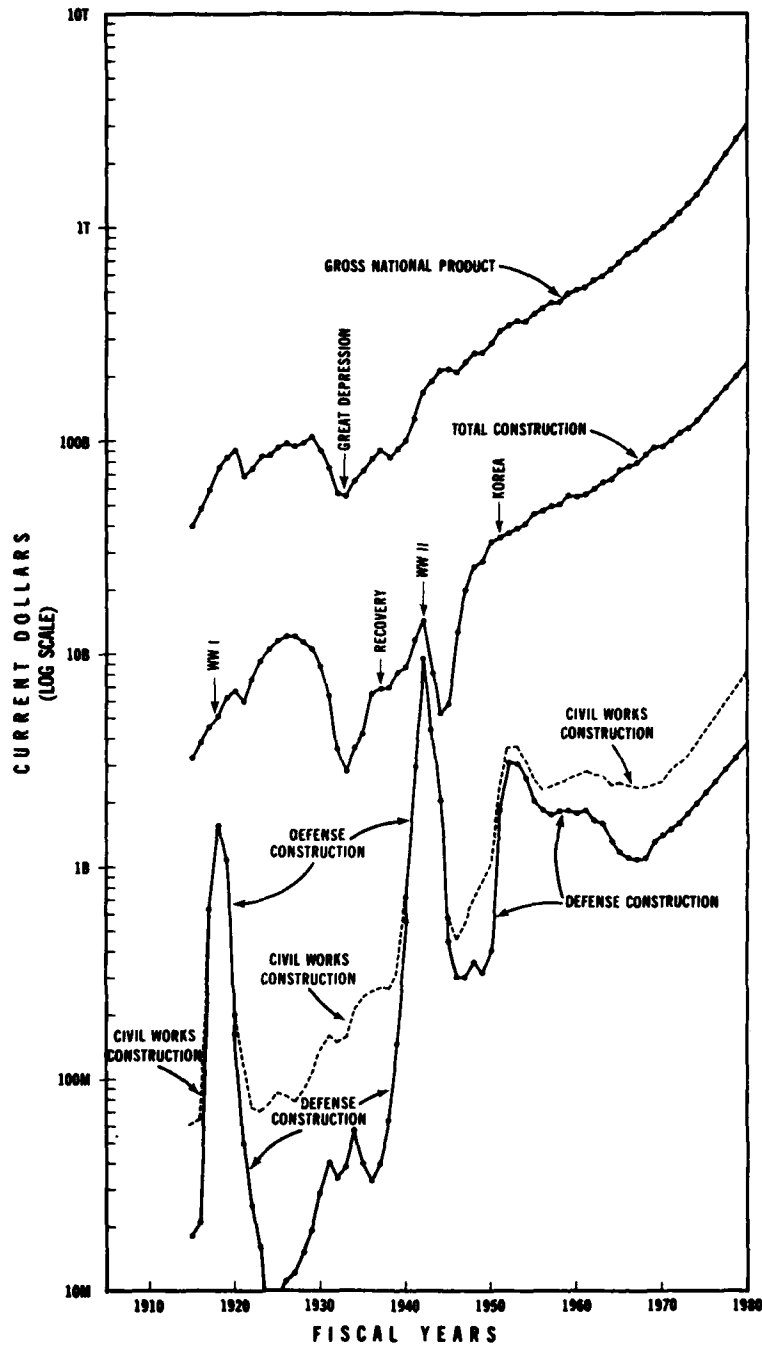
(Figure 1 Continued on Next Page)

EMERGENCY POWERS SUMMARY--Continued
(US Code)

Title No.	Section	Summary
10	9773	Relates to the acquisition and construction of air bases and depots during national emergencies.
15	2621	Provides waiver procedures of pollution abatement requirements for toxic substances.
16	470	Provides relief from the Endangered Species Act.
33	1323	Provides waiver procedures of water pollution standards for Federal facilities.
33	1344	Provides relief from state laws in maintaining navigation channels.
41	11	Permits the Armed Services to purchase clothing, subsistence, forage, fuel, quarters, transportation, medical and hospital supplies, which, however, shall not exceed the necessities of the current year, without an appropriation from Congress.
	300J-6(b), 4903, 7412, 7418, 7606	Provides exemptions to water, air, and noise pollution abatement provisions.
42	6961	Provides exemptions to solid waste disposal standards.
50	1431	Relates to authorization to enter into defense contracts or into amendments or modifications of defense contracts without regard to certain other provisions of law.
50	1211, 1213, 1216	Relates to renegotiation of contracts.
50	2291-2295	Relates to authorities in a CD emergency.

Figure 1

CONSTRUCTION DEMANDS AND GROSS NATIONAL PRODUCT: 1916-1980



SOURCES:

1. Newspaper Enterprise Assoc, Inc., The World Almanac and Book of Facts 1979.
2. Dept of Commerce, Bureau of the Census, Statistical Abstract of the United States: 1978.
3. _____, Historical Statistics of the United States--Colonial Times to 1970.

Figure 2

since 1916. As can be seen from this history, CONUS defense construction during World War I, World War II, and, to a degree, Korea was a significant portion of total construction and the Gross National Product. Vietnam was a partial mobilization conducted external to the US. Whether significant defense construction peaks would exist in a future full or total mobilization can only be speculated. In 1916 no one would have predicted the peak experienced in 1918. Similarly, in 1939, no one would have predicted the peak of 1942. There are at least two significant lessons here. First, CW is only a partial cushion for the defense construction expansion in full or total mobilization. Second, prudent mobilization planning based on this history would dictate that the Corps should posture itself to respond immediately to work efforts that are 10 to 50 times greater than are being experienced in peacetime.

(2) Mobilization requires a large decentralized construction management force in being. The decentralized mode in which the Corps normally operates through its divisions and districts permits it to respond to the needs of local installation and MACOM commanders more effectively than if operations were centrally controlled. The division and district engineers' knowledge about local conditions and resources is invaluable for meeting the needs of local situations quickly and effectively. At the same time, this diffusion of control requires that division and district planners initiate the coordination and close working relationships with local installation commanders and other officials. This ensures that Corps plans reflect the changing status of conditions and requirements within their areas of responsibility.

(3) Mobilization construction standards must be austere in material and time consumption. Normal CW design standards emphasize permanency.

Mobilization design standards emphasize expediency. Prior to and during World War II, the Corps had to develop much of the engineering capability and expertise needed for the temporary construction and operations and maintenance (O&M) of military facilities. Future mobilizations will not permit the luxury of time to develop these skills. Therefore, such skills must be kept current at all times. The Corps needs carefully designed and systematic training programs so that district personnel are familiar with mobilization standards and procedures.

(4) A positive synergism exists between MC and CW. The Corps must expect that many of the military personnel at division and district levels will be lost at varying stages of mobilization. The expertise engineer officers acquire at division and district levels in all phases of management and construction is invaluable because such skills also are required in a theater of operations. Military priorities probably would dictate the use of such experienced personnel in an active theater. Therefore, Corps division and district civilian personnel augmented by mobilization designees (MOBDES) must be prepared to step into the crisis management roles of military support. Again, a viable cross-training program may be required to ensure this capability.

c. Contemporary conditions. Experience must be tempered by current conditions and trends in projecting plans into the future. What do knowledgeable Corps personnel see as the primary problems? There were working conferences with the Baltimore, Fort Worth, and Vicksburg Corps District representatives during the course of this study effort. These conferences were designed to elicit from those that would be most affected by mobilization, their perception of the problems facing them in mobilization, and mobilization

planning. The problems identified in these conferences are presented and explained below in priority order. To some extent, these problems are addressed in this monograph. To a somewhat larger extent, their solution must be found in actions to be taken by the Office of the Chief of Engineers (OCE) or other government agencies.

(1) Mission refinement and time phasing. Corps planners believed that their number one problem was obtaining a clear understanding of the support requirements, by Corps district, during mobilization and the time phasing necessary for the requirements to be met. These requirements should be in terms of those for the MACOMs and their installations, the other services, and others in the nonmilitary sectors. This monograph discusses requirements in general, but a precise definition of all requirements will depend on continuous coordination between Corps division and district engineers and installation commanders within the division and district boundaries.

(2) Streamlining statutory and regulatory authority. Corps planners believed that they are not currently well enough informed on what could or could not be done within the law under mobilization conditions. While Figure 1 summarizes some of the major relief measures that exist, there are areas in which the streamlining of regulations may have to come from actions by OCE or higher authority.

(3) Organization actions. The planners perceived a need for more Corps organization activities relative to preparing the Corps for mobilization tasks. There needs to be such actions as ensuring that mobilization tables of distribution and allowances (TDAs) are properly structured and manned, cross-training of personnel to ensure a smooth transition to mobilization, and

formation of designated mobilization teams at the district level to undertake specific tasks well in advance of mobilization.

(4) Allocation of resources. Despite the high priority given to mobilization by OCE and the Army, planners felt that insufficient resources were allocated to mobilization planning. All Corps levels need time, money, and manpower to adequately develop mobilization plans and carry out pre-mobilization actions if the Corps is to meet mobilization requirements.

(5) Intra-Corps relationships. Planners perceived a need for a clear definition of intra-Corps mobilization responsibilities. There is a need to ensure that the "one-stop" theory applies to mobilization tasks to keep installation commanders from having to go to more than one Corps representative for support. Divisions and districts must have functional and territorial responsibilities fully determined in advance of mobilization. Although there appears to be no serious problem resulting from the different territorial delineations of CW districts, MC districts, etc., such determinations are necessary.

(6) Inter-government relationships. There is a need to clearly define the Corps' role in mobilization vis-a-vis other government agencies. This is particularly true with the establishment of the Federal Emergency Management Agency (FEMA). A DOD-FEMA interagency group currently is working on a delineation of responsibilities, but considerable work remains to be done.

(7) Construction priorities. Planners believe that construction priorities needed to be established for mobilization so that effort could be allocated to achieve maximum benefit. Potentially conflicting mobilization construction demands can be foreseen and such conflicts must be avoided to make the best use of Corps resources. Included in establishing priorities should be

provisions for the immediate transfer of CW funds to MC when mobilization is declared.

(8) Laboratory support. Engineer laboratories should be dedicated during mobilization to providing site-specific support for the divisions and districts charged with construction, expansion, etc. of military installations and facilities. Such site support could be invaluable to Corps personnel who have to cope with difficult construction problems. The laboratories also need to maintain their expertise in their specialty areas (such as harbor development or port construction) to offer immediate guidance as required.

d. The foregoing has addressed some of the key questions relative to the Corps' role in mobilization. However, these and others are contingent to a large extent on the questions of Corps capability and specific requirements. These are discussed and, insofar as possible, quantified in the following sections.

II. PERSONNEL RESOURCES

4. General. To support the military and the nation in mobilization, the Corps must bring to bear adequate resources to meet a variety of requirements ranging from construction management to facility O&M. The Corps' personnel resources are the key to meeting these diverse requirements. This section provides a general evaluation of those human resources as they are distributed within CONUS and the effect the three mobilization conditions have on that resource base. This evaluation is designed to assist Corps planners in determining the personnel available to them in a mobilization situation and in developing mobilization plans allocating personnel for specific tasks.

5. Peacetime Strengths. The base for the Corps' mobilization capability is its peacetime work force. This work force will vary in strength and disposition over time because of retirement/termination losses, new hires, temporary hires for seasonal activities (such as recreational facility operation), and fluctuations occasioned by mission or program changes. However, in the aggregate these strength variations will tend to be offsetting so that taking a snapshot of Corps actual strengths at a particular time provides a reasonable assessment of strength and disposition. For purposes of this study, the Corps strength is 50,340 (see Figure 3).^{5/} This strength includes OCE

^{5/} This figure is considered exceptionally high by the Resource Management Office (RMO), OCE Headquarters. Potential errors in the Corps Stratification tape, used in this report to obtain a functional breakout of CONUS Corps personnel, and the inclusion of temporary employees in this report probably account for the disparity between RMO figures and those used here. However, for purposes of a mobilization work force, temporary employees should be included since they constitute a resource that can be immediately applied to certain mobilization tasks. Further, use of the Corps Stratification tape, despite potential errors, is necessary to obtain a functional breakout of personnel. From this functional breakout, it is possible to derive percentages of personnel that can be transferred from peacetime to mobilization tasks. Thus, the figures used in this report provide a base and functional profile for planning purposes despite discrepancies between various sources on actual numbers of Corps employees.

CORPS PEACETIME PERSONNEL STRENGTH

Organization	Mili- tary	Civilian	Total
OCE Headquarters ^{a/}	89	1,017	1,106
Division/District			
Europe (EUD) ^{b/}	c/	541	541
Lower Mississippi Valley (LMVD)	5	276	281
Memphis	3	1,818	1,821
New Orleans	8	2,426	2,434
St. Louis	4	1,251	1,255
Vicksburg	8	2,150	2,158
Middle East (Rear) (MED(R))	4	398	402
Middle East (Forward) (MED(F))	81	786	867
Missouri River (MRD)	5	344	349
Kansas City	9	1,311	1,320
Omaha	15	1,832	1,847
North Atlantic (NAD)	4	233	237
Baltimore	14	1,593	1,607
New York	12	798	810
Norfolk	4	634	638
Philadelphia	6	809	815
North Central (NCD)	3	317	320
Buffalo	5	589	594
Chicago	5	668	673
Detroit	4	1,019	1,023
Rock Island	5	688	693
St. Paul	5	1,249	1,254
New England (NED)	6	851	857
North Pacific (NPD)	5	501	506
Alaska	23	412	435
Portland	9	1,579	1,588
Seattle	9	1,052	1,061
Walla Walla	5	755	760
Ohio River (ORD)	3	297	300
Huntington	10	1,300	1,310
Louisville	6	1,068	1,074
Nashville	7	1,299	1,306
Pittsburgh	5	1,232	1,237
South Atlantic (SAD)	9	305	314
Charleston	5	192	197
Jacksonville	9	1,138	1,147
Mobile	13	2,816	2,829
Savannah	10	1,265	1,275
Wilmington	4	515	519

(Figure 3 Continued on Next Page)

CORPS PEACETIME PERSONNEL STRENGTH--Continued

Organization	Mili- tary	Civilian	Total
South Pacific (SPD)	7	216	223
Los Angeles	11	717	728
Sacramento	13	1,083	1,096
San Francisco	11	489	500
Southwestern (SWD)	18	293	311
Albuquerque	4	298	302
Fort Worth	13	1,430	1,443
Galveston	3	588	591
Little Rock	3	964	967
Tulsa	3	1,393	1,396
Huntsville (HND)	6	338	344
Laboratories			
Waterways Experiment Station (WES)	31	1,335	1,366
Coastal Engineering Research Center (CERC)	3	151	154
Construction Engineering Research Laboratory (CERL)	2	218	220
Cold Regions Research and Engi- neering Laboratory (CRREL)	15	298	313
Engineer Topographic Laboratory (ETL) ^{d/}	15	284	299
Other^{e/}			
Facility Engineering Support Agency (FESA)	156	123	279
Engineer Studies Center (ESC)	6	41	47
Total	756	49,584	50,340

SOURCE: Except as noted in footnotes, civilian strengths are from DA, OCE, Pers Ofc, Corps Stratification, March 1979; military strengths are from DA, OCE, Pers Ofc, Military Personnel, Information Roster, 25 July 1979.

a/ OCE Headquarters strength as of 1 October 1979.

b/ EUD, MED, and HND division strengths as of 1 October 1979.

c/ Military strength at EUD not included since these would not be returned to CONUS in event of mobilization.

d/ ETL strengths as of 1 November 1979.

e/ FESA and ESC strengths as of 15 October 1979.

Figure 3

Headquarters, CONUS divisions and districts, laboratories, and other selected field operating activities. Also included in this figure are the US civilians in EUD and personnel in the MED(F). Tentatively, these overseas personnel would be evacuated to CONUS sometime after mobilization was declared if the necessary lift were available--something which in itself is questionable. The totals do not include personnel from the Pacific Ocean Division (POD) since it is presumed that these personnel would remain in their current positions and not add materially to meeting CONUS mobilization requirements. Annex B of this monograph provides a more detailed breakdown of the personnel strengths and a broad functional breakout of personnel in CONUS divisions and districts.

6. Full Mobilization Strengths. All Reserve components are activated with the declaration of full mobilization. As discussed in the next section, the requirements generated by such an activation, the induction of additional personnel, and all other activities associated with mobilization will create an entirely different workload for the Corps than experienced in peacetime. This means that many Corps personnel at division and district levels will have to be shifted from their primary peacetime functions to predetermined mobilization functions. Figure 4 shows, qualitatively, the magnitude of the workload shift. These workload shifts will impact on individual divisions and districts to varying degrees. Therefore, division and district engineers will have to determine the specific personnel allocations to the mobilization tasks identified for their area of responsibility. What human resources will be available to allocate to these tasks cannot be precisely determined for each Corps element, but some general guidelines can be set for planners. Starting with a CONUS personnel strength of 675 military and 48,257 civilians for a total of 48,932 (excluding personnel in EUD and MED(F)), certain factors can

PEACETIME → MOBILIZATION MISSION AND FUNCTION SHIFTS

	Civil Works	Military Construction
New		<ul style="list-style-type: none"> .Security of Critical Facilities
Increase (Greatly)	<ul style="list-style-type: none"> .Construction Contract Termination .Security of Critical Facilities 	<ul style="list-style-type: none"> .Facility Engineer (FE) Support .Communications .Production Base Support .Leasing and Acquisition .Expedient Construction .Procurement .Work Force at Area Offices .Acceleration of Essential Construction .Intra-Corps, Inter-government Coordination .Site-specific Support
Decrease (Greatly)	<ul style="list-style-type: none"> .Water Resource Planning .Design .Nonessential Construction .Recreation .Regulatory Functions .Maintenance on Noncritical Facilities 	<ul style="list-style-type: none"> .Nonessential Construction .Master Planning

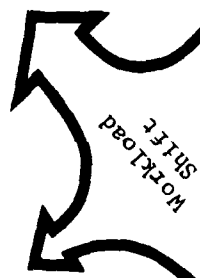


Figure 4

be applied that increase or decrease these figures. Figure 5 shows the factors affecting personnel strengths, and these are discussed below.

FACTORS IMPACTING ON CORPS CONUS MOBILIZATION STRENGTH

Decreasing Factors	Increasing Factors
. Critical continuing activities	. MED(F) evacuation
. Military personnel reassignments to Europe	. EUD evacuation
. Reserve activation	. MOBDES
. Disaster recovery support	. Emergency recruitment
. FE requirements	. 416th Engineer Command

Figure 5

a. Decreasing factors. There are a series of factors that could decrease the number of Corps personnel available for mobilization tasks. In some cases these factors can be quantified. However, in general, it will be a requirement of division and district engineers to refine estimates of potential personnel losses so as to best plan for allocating personnel during mobilization.

(1) Critical continuing activities. Even in a full mobilization situation, the Corps will continue to operate critical facilities that are Corps operated in peacetime. Critical activities that must be continued include O&M of locks, dams, and other facilities along primary waterway arteries; hydropower production; and O&M at any other facilities that must be kept open to meet military and national needs. Obviously, the extent of such O&M functions will vary from district to district depending on the number of Corps-operated facilities within a district. What can be assessed, however,

is a general idea of how many Corps personnel would be needed to continue such tasks, leaving the rest for more direct mobilization tasks. The study team made an assessment of available (for mobilization) personnel by function using the Corps Stratification functions and considering what civil functions could most logically be dropped or significantly reduced in a mobilization situation. Figure 6 shows that general assessment applied to the Corps Stratification functions. Estimates were made for certain support functions with a weighted estimate developed from proportions of all other functions contributing to mobilization. This convention was applied across the civil-funded positions in CONUS (excluding MED(F), MED(R), EUD, and POD). When resultant civil-funded positions were added to the Corps' military-funded positions (which are totally dedicated to mobilization in the MC area), it appears that 75 percent of Corps employees would be available for mobilization tasks. This means that about 12,000 civilian personnel in the Corps CONUS work force must be allocated to critical continuing activities, leaving about 36,000 civilians available for mobilization tasks. Probably the same proportions can be applied to the military spaces within the same Corps base, leaving about 600 military personnel available for mobilization tasks. Planners should recognize that these figures are based on a convention that is an estimate and a weighting of resultant factors. Also, the figures, in actuality, would not be applied equally to each district or other Corps element. However, the figures probably provide a good base from which Corps planners can start. More importantly, they identify those functional areas in which cross-training of personnel should be accomplished to ensure that personnel can shift to mobilization functions from their current primary functions. The number of people requiring such cross-training cannot be precisely determined until specific

CIVIL FUNCTIONS AND ASSOCIATED PERCENTAGES OF AVAILABLE PERSONNEL
(Corps Stratification Functions)

Function	Personnel Avail- able for Mobiliza- tion Missions (%)	Function	Personnel Avail- able for Mobiliza- tion Missions (%)
<u>Office Functions</u>			
Planning and Reports	100	Procurement	90
Flood Plain/Urban Studies	100	Supply	90
Environment and Studies	100	Contracts	90
Structural	90	Government Furnished Equip- ment (GFE) Procurement	90
Design/Technical Engineer	90	Counsel	90
Foundation and Materials	90	Public Affairs	90
Hydraulics/Hydrology	90	Safety	90
Relocations	90	Contract Administration	80
Estimating and Specs	90	Supervision and Inspection	80
Survey	90	Security/Provost Marshal	0
Electrical/Mechanical	90	Executive Office	73 ^{a/}
General Engineering	90	Trainees	100
Drafting and Mapping	90	EEO	73 ^{a/}
Hydropower	0	Engineer Inspector General	0
Navigation	0		
Regulatory Functions	90	<u>Field Functions</u>	
Resource Management	90	Field Survey	90
Plant and Maintenance	0	Testing/Exploration	100
Miscellaneous Operations	0	Field General Engineer	90
Acquisitions	95	Field Inspection	80
Appraisals	95	Field Contract Admin	80
Management and Disposal	95	Floating Operations	0
Planning and Control	95	Lock and Dams	0
Budget	73 ^{a/}	Field Power Operations	0
Finance and Accounting	73 ^{a/}	Field Plant and Maintenance	0
Audit	73 ^{a/}	Field Resource Management	90
Management Analysis	73 ^{a/}	Misc. Field Operations	90
Program Development	73 ^{a/}	Dredging	100
Secretarial	73 ^{a/}	Regulatory Functions	90
Reproduction	73 ^{a/}	Acquisition	95
Mail and Records	73 ^{a/}	Appraisals	95
General Services/Admin	73 ^{a/}	Management and Disposal	95
Clerical	73 ^{a/}	Planning and Control	95
Library	73 ^{a/}	Field Secretarial/Typing	73 ^{a/}
Recruiting and Placement	73 ^{a/}	Field Admin Services	73 ^{a/}
Position and Pay Management	73 ^{a/}	Field Financial	73 ^{a/}
Management Employee Relations	73 ^{a/}	Field Personnel	73 ^{a/}
Technical Services	73 ^{a/}	Field Supply	73 ^{a/}
Manpower Management	73 ^{a/}	Misc. Field Services	73 ^{a/}
Training	73 ^{a/}	Field Trainees	100
Systems and Programming	73 ^{a/}	Field Clerical	73 ^{a/}
Computer Operations	73 ^{a/}		

^{a/} Value is based on the proportion of available personnel from all other functions.

Figure 6

assignments are made. However, it is estimated that about 23,000 civilian and military Corps employees will require some degree of cross-training to be able to assume mobilization duties within the required response time.

(2) Military personnel reassignments to Europe. In a full mobilization situation, plans call for forming two engineer commands in Europe. Fully staffing these commands will require assignment of military personnel currently in Europe plus an augmentation of officers from CONUS. Although plans for such augmentations are not firm, latest estimates are that about 31 officers would have to come from CONUS. Figure 7 lists the breakdown of proposed augmentations by officer grade. Specific individuals or positions to be used to fill these mobilization slots in Europe have not been designated, but for safe-sided planning purposes it must be assumed that they will come from Corps divisions and districts (rather than from OCE Headquarters or laboratories) in CONUS. These reassignments must be anticipated within the first 15 days of the mobilization period. Therefore, Corps division and district planners should recognize the likelihood of about a 5 percent reduction in Corps CONUS-based officer personnel.

TENTATIVE OFFICER AUGMENTATIONS
FOR EUROPE

Grade	Number
O-5 (LTC)	4
O-4 (MAJ)	15
O-3 (CPT)	11
WO	<u>1</u>
Total	31

Figure 7

(3) Reserve activation. Full mobilization requires the activation of all Reserve components; this will have an impact on the Corps CONUS structure. Those Corps civilian employees who are members of the military Reserve or National Guard can expect to be activated. Some of these Reserve components will fill positions within the Corps' TDA organizations that come into being with a mobilization declaration. These individuals will not be lost to the Corps, although their specific functions may change. However, there are other reservists within the Corps who will be lost to the Corps on activation--personnel who will go to troop commands outside the Corps or to other services. A deficiency in the personnel data needed for planning is the lack of an accurate count of Corps reservists. While there are specific assignments of MOBDES within the Corps, there is no central roster of all reservists currently employed by the Corps. Corps planners, thus, should be prepared to account for certain personnel losses as Reserve components are activated. A possible solution for overcoming the uncertainty in this area would be for each major Corps element to survey its personnel to determine their Reserve status and assignment.

(4) Disaster relief/recovery. The Corps' primary function in mobilization is to support the military and nation in mobilization tasks. However, circumstances can be envisioned wherein the Corps would also have to respond to a natural disaster.^{6/} A particularly devastating natural disaster could exceed any local or state capability to respond, and Corps resources would have to be used to some extent to assist. During peacetime the Corps normally responds to such disasters, but the allocation of Corps resources in

^{6/} Natural disasters here refer to hurricanes, tornadoes, earthquakes, and floods.

wartime for such purposes would have to be carefully weighed against mobilization requirements. Certainly the Corps would expect to respond if a natural disaster involved a military installation, production base facility, or key transport artery. The question then concerns help to strictly civilian communities. Still, Corps planners probably should plan to allocate some personnel for natural disaster relief just as a precaution. It is difficult to determine the number of personnel to allocate. Not only are there large uncertainties based on the vagaries of nature, but historical records are deficient in terms of Corps manpower effort expended. For example, between 1968 and 1978, the Corps spent an average of \$54 million per year on natural disaster prevention, relief, and recovery. However, during that 10-year period, expenditures ranged from about \$100 million to lows of \$5-7 million for individual years. These dollar figures are misleading in terms of Corps effort since they include both manpower and material costs. Also, some of the money expended in these efforts was reimbursable from the FEMA or its predecessors. Beginning in FY 1980, recordkeeping has been changed so that dollar figures and Corps manpower effort are being assessed. Sufficient records are unavailable to make any determinations now of the magnitude of Corps manpower that might be required for natural disaster. However, obviously Corps division and district planners need to retain flexibility within their plans for allocating some manpower to such efforts. Hurricane Frederic, which hit the Gulf states in 1979, is an example of how a major natural disaster requires large numbers of Corps personnel. Through November and into December 1979, some 400 Corps personnel were involved in recovery efforts. Of these, 120 came from the Mobile District (about 5 percent of the work force). The remaining 280 were augmentees from other districts. This illustrates the

level of Corps involvement that cannot be completely ignored even though it is unlikely that the Corps would or could devote this much effort to natural disaster recovery during a national mobilization, particularly in the early phase of mobilization.

(5) FE requirements. In full mobilization, the expansion of the military base structure to accommodate activated Reserve elements and trainees will require opening semi-active installations, expanding capability at currently active posts, and taking over some currently state-owned, state-operated installations. The section below on Corps mobilization requirements lists the facilities considered for full mobilization. An FE already exists in cases where currently active facilities are used and expanded. However, it may be necessary to augment the FEs at some of these posts where expansion will take place. At most of the semi-active posts, United States Army Reserve (USAR) garrisons are available, but these may require some FE augmentations depending on the troop load planned for the installation. In the case of state-operated installations, most will require a garrison force, including FEs. Figure 8 lists those posts where a garrison force would be needed. The Corps should be prepared to provide FE augmentations in all cases where that support is required. To a large extent, such FE support may be provided by MOBDES personnel who fill slots in the Corps' mobilization TDAs. However, in so doing, Corps capability to undertake other vital mobilization tasks, such as construction management, will be degraded. Alternatives to pulling FEs from divisions and districts are being considered, as discussed below, but nothing definite has been decided. Until a firm decision is forthcoming, district engineers and planners may have to plan to use some of their manpower resources to augment installation FE MOBDES TDAs to ensure that installations

have adequate FE support. Planning for this will have to be done in conjunction with installation and MACOM commanders and in recognition of the manpower loading schedule currently being developed by the MACOMs.

MOBILIZATION POSTS REQUIRING GARRISONS

Status/ Installation	Location	MACOM	Responsible Engineer District
<u>Semi-active</u> Fort McCoy	Sparta, WI	US Army Forces Command (FORSCOM)	Omaha
<u>State Operated</u> Camp Atterbury	Edinburg, IN	US Army Training and Doctrine Command (TRADOC)	Omaha
Camp Blanding	Jacksonville, FL	FORSCOM	Mobile
Camp Edwards	Falmouth, MA	--	New York
Camp Ripley	Little Falls, MN	--	Omaha

Figure 8

b. Increasing factors. While there are factors that will degrade Corps personnel strength in full mobilization, there are other factors that could increase the strength. The decreasing and increasing factors will not precisely offset each other, and Corps planners should be aware of this. Also, no increase in manpower will offset the loss of experienced personnel immediately, since there will be some learning curve for incoming personnel filling a completely new position. Planning, therefore, should take this into account and provide for such dual training or early-on training as is appropriate for incoming personnel. Factors that could increase Corps strength are discussed below.

(1) Evacuation from MED(F). Tentatively in a full mobilization, there are plans to evacuate Corps military and civilian personnel from the MED(F) to CONUS. There are no formal plans yet as to evacuation procedures or timing. A large caveat that must be considered here is that such an evacuation would be possible only if the lift were available to carry it out. However, the availability of such lift is questionable. Military and Civil Reserve Air Fleet (CRAF) aircraft will most likely be fully used to support forces in Europe. Thus, if the evacuation were affected, it most likely would have to be through charter of foreign air carriers or by surface transport. In either case, the 867 personnel from the MED(F) could not be expected to arrive in CONUS much before M+30. How to allocate these personnel to Corps divisions and districts has not been determined, but presumably the 786 civilians would be available to supplement the Corps CONUS work force where needed. The 81 military personnel could be redeployed to Europe, the engineer troop training base, or to the Corps work force as the need existed. However, because the MED(F) personnel could not be expected in CONUS before M+30, they would not be available for the initial heavy workload that mobilization would place on the Corps.

(2) Evacuation from Europe. Initially, the thought was that the 541 US civilian employees in EUD would be evacuated to CONUS on mobilization. However, new tentative planning at EUD is that civilian members of the Reserves would be activated and remain in-theater. The other civilians would be asked (prior to mobilization) to volunteer to remain in noncombat jobs in Europe with the engineer commands that are to be established at mobilization. How many individuals would agree to remain is not known at this time nor is it known how many civilians are reservists. It appears safe to assume that some

of the civilians would opt for returning to CONUS where they could be employed in the Corps CONUS work force. However, such an evacuation, like the tentative one from the MED(F), would be contingent on the availability of lift and, in any event, probably could not be effected before about M+30. Thus, planners should not consider that the EUD work force to be evacuated to CONUS will be available to assignment to Corps elements until after the initial mobilization workload is past.

(3) MOBDES. On mobilization, Corps divisions/districts go to a TDA in which most Corps elements have military positions to be filled by designated reservists. As of 2 November 1979, about 82 percent of the MOBDES slots had personnel assigned to them. Figure 9 is a breakdown of MOBDES slots and assigned personnel by Corps element. Generally, it is felt that MOBDES will augment the Corps work force. However, many of the MOBDES are already Corps employees who, when activated, would do little more than change into a uniform and assume new or related duties. Also, it must be remembered that some Corps employees are reservists who, when activated, will go to some other organization or service. Since no count of such reservists is maintained, there is a question as to whether activation of all Reserve components and assignment of MOBDES will result in a net gain or loss to the Corps. Therefore, until they can obtain accurate data on reservists, Corps planners will have to consider MOBDES only as uncertain net augmentations to the Corps.

(4) Emergency recruitments. One major area of potential Corps augmentation is in the emergency recruitment of civilian personnel. Statutory provisions exist to permit the immediate hiring of personnel in emergencies. Many areas near division/district headquarters have pools of retired or former Corps personnel who are experienced and could be counted on to immediately

CORPS MOBILIZATION DESIGNEES
(As of 2 November 1979)

Organization	No. of Slots	Assigned	Organization	No. of Slots	Assigned
OCE Headquarters	70	61	<u>Division/District</u>		
<u>Division/District</u>			SAD	24	21
EUD	--	--	Charleston	10	9
LMVD			Jacksonville	23	20
Memphis	--	--	Mobile	17	14
New Orleans	--	--	Savannah	22	13
St. Louis	--	--	Wilmington	13	7
Vicksburg	--	--	Total	109	84
Total	--	--			
MED(R)	--	--	SPD	8	6
MED(F)	--	--	Los Angeles	12	9
Total	--	--	Sacramento	13	8
			San Francisco	11	11
			Total	44	34
MRD	9	7	SWD	8	8
Kansas City	12	9	Albuquerque	10	10
Omaha	21	18	Fort Worth	8	6
Total	42	34	Galveston	11	8
			Little Rock	8	8
NAD	13	12	Tulsa	12	12
Baltimore	10	9	Total	37	32
New York	22	18			
Norfolk	11	11	HND	--	--
Philadelphia	18	9	Lab	--	--
Total	74	59	WES	--	--
NCD	4	2	CERC	--	--
Buffalo	--	--	CERL	--	--
Chicago	12	10	CRREL	--	--
Detroit	--	--	ETL	3	2
Rock Island	--	--	Total	3	2
St. Paul	6	4			
Total	22	16	Other		
NED	14	14	FESA	--	--
			ESC	--	--
NPD	2	1	Total	--	--
Alaska	--	--			
Portland	9	9			
Seattle	--	--			
Walla Walla	4	4			
Total	15	14	Grand Total	493	402 ^{a/}
ORD	4	4			
Huntington	8	6			
Louisville	8	4			
Nashville	7	6			
Pittsburgh	16	12			
Total	43	32			

SOURCE: Corps of Engineers TDA, 2 November 1979.

^{a/} TDA of POD, Far East District Rear, and Pakistan element not included.

Figure 9

respond to a call to support Corps mobilization requirements. In those areas where such pools of former employees exist, there may well be sufficient personnel available to fill any need for augmentations. There also is the option of recalling retired military personnel to active duty. However, this can be a time-consuming process, and impossible to do during the critical early days of mobilization. Thus, division/district planners should assess the situation in their particular area to determine whether the potential exists for emergency recruiting of experienced personnel. It is possible that this type of augmentation could fulfill all Corps requirements for additional personnel in some areas.

(5) 416th Engineer Command. Various concepts currently are being investigated to identify a wartime mission for the 416th Engineer Command. In examining these concepts, the current makeup of the command should bear heavily on the outcome. The 416th is divided into two elements: a Table of Organization and Equipment (TOE) element of about 250 people and a TDA element, also of about 250 people. The TOE element is oriented on command and control functions for assigned engineer units; its engineer section has wide-ranging experience and capacity and forms a nucleus that could serve the Army well during mobilization. The TDA element is divided into 40 teams of about 5 people each that currently survey Reserve installations and facilities nationwide to determine maintenance and construction needs. This survey activity may soon be expanded to include active and semi-active unit installations. While there is no plan to alter the current size or mission of the command, the Army Staff and others are considering several alternatives in developing a wartime mission for the 416th including:

(a) Alternative 1:

1. The command would continue its peacetime missions.

2. On M-day the command would be disestablished.

3. The disposition of the command after M-day would be:

a. The TOE portion would be integrated into the OCE mobilization TDA structure for possible deployment to a yet unidentified area (possibly the Middle East).

b. The TDA portion would be broken up to constitute FE support teams where needed at military installations or the teams would be integrated into the mobilization TDAs of selected installations.

(b) Alternative 2:

1. The command would continue its peacetime mission in a reconfigured form with a clearly recognized interface between the Corps and HND to permit comprehensive planning for mobilization.

2. On declaration of mobilization, the command would be amalgamated within the Corps (perhaps with HND and FESA) to form an element for providing broad FE support in pursuance of a rapid transition to emergency construction/facilities actions.

(c) Alternative 3:

1. The command would continue its peacetime mission in some reconfigured form.

2. On declaration of mobilization, the command's personnel would be integrated into the MACOM engineer mobilization TDAs as required.^{7/}

^{7/} There may be additional options for employment of all or part of the 416th in a CONUS mobilization support role to provide FE or other engineering capability. The final disposition of the command is still undecided. However, Corps planners should be aware of this potential manpower resource for mobilization and closely monitor developments concerned with the 416th so that effective use can be made of these valuable personnel assets.

c. Summary. The net result of applying decreasing and increasing factors to the Corps CONUS work force is difficult to precisely quantify. An estimate can be made that initially the work force for mobilization tasks would consist of about 36,600 civilian and military personnel. Taking all other decreasing and increasing factors into consideration would change this figure less than 10 percent. What does appear significant is that there will be some major functional shifts of personnel from civil to military support functions. These shifts will have to take place immediately on mobilization which will require that personnel be designated for specific mobilization tasks well in advance of mobilization. In turn, this will require considerable cross-training of personnel so that they can make the functional shifts with a minimum of problems and facilitate the mobilization tasks.

7. Total Mobilization (Conventional). The primary difference between full and total (conventional) mobilization situations is the period of time the mobilizations are expected to last and the increased commitment of men and resources in the latter mobilization condition. Initially, the impact on Corps manpower of total mobilization (conventional) and full mobilization is the same--there will be losses of experienced officers and some reservists very early in the mobilization at a time of rapidly increasing work requirements. Augmentations of the Corps work force using evacuated personnel from MED(F) and EUD, while of limited value in a full mobilization scenario, probably would be of decided benefit in total mobilization (conventional). This is because a second surge in workload occurs during the latter condition some months after the initial workload peak. The second surge occurs during expansion of the military base structure, the production base, and supporting infrastructure to accommodate the large military manpower increase aimed at

creating new units. However, this surge in Corps workload can be scheduled in a more orderly manner since it begins 6 months or so after meeting initial requirements. Such scheduling would permit an orderly filling of essential Corps positions through recruiting and training. While ultimately the manpower demands on the Corps could be heavier in total mobilization (conventional) than in full mobilization, there appears to be time to meet the demands through a more normal process.

8. Total Mobilization (Nuclear). A strategic nuclear attack against the US mainland could occur in conjunction with a mobilization for conventional war or only after a period of increased international tension. Even a nuclear attack with no warning whatsoever must be considered a possibility. In a post-nuclear attack environment, the Corps' capability to undertake tasks related to national survival, recovery, and any other phase of nation or military rebuilding depends on the number of employees surviving the attack. This residual Corps work force can be estimated only in the broadest general terms, since there are so many variables involved in postulating the nature of a nuclear attack on CONUS. Several government-sponsored studies have estimated casualties among the general US population based on sets of assumed conditions. Corps casualties based on results of the latest of such studies were estimated for this report to provide a general notion of the work force size that might be available after a possible nuclear attack. Annex C contains details on the derivation of the residual work force discussed below and other aspects of nuclear attacks.

a. Attack size. Hypothetical attacks used in planning may range from an all-out attack on CONUS (see Figure C-1, Annex C) to one that is limited to the US counterforce and other important sets of defense-related

installations such as manufacturing industries and airfields. Annex C briefly outlines the generally accepted priorities for target assignments. In the large-scale attack, only three of the cities with Corps headquarters are not targeted.

b. Warning and CD. Government planners generally believe that an attack probably would be preceded by a period of international tension lasting from a few days to even many months, but an attack with little or no warning cannot be ruled out. A period of tension could provide the time needed by the general population to implement one or more possible CD measures to reduce vulnerability to nuclear weapons effects. Crisis relocation is the CD program recommended by the SECDEF and supported by the President for fiscal years 1980-1984. The SECDEF further recommended maintaining a hedge for in-place protection in case time or circumstances did not permit crisis relocation. A crisis relocation program (CRP) calls for the evacuation from high-risk areas to surrounding "host" areas and involves much more than moving people and sheltering them. CRP can be effective only if several days to a week are available for evacuation, plans for evacuation can be executed effectively, and support systems for a balanced CD system exist. Although CRP is well underway for certain high-risk areas, it has a long way to go before it becomes reality nationwide.

c. Residual Corps work force. The residual Corps work force was estimated in two ways. The first estimate (Case I) was made by applying the results of a study on nuclear weapons effects on Detroit, Michigan to major urban areas containing Corps division and district headquarters (see Figure C-1, Annex C). A second estimate (or Case II) was made by applying the results of an attack on general population targets to Corps headquarters and

field personnel. Annex C contains details on computation methods and the attacks. Results of the estimates are described below.

(1) The basic Corps work force available in a total mobilization (nuclear) would be essentially that which exists within CONUS. No increase in that force could be expected in a nuclear attack because of the limited warning time. Thus, this work force excludes consideration of EUD and MED(F) personnel or any potential augmentees from MOBDES or emergency recruiting of civilians. The total work force base consists of 48,931 personnel.

(2) The estimated residual work force in Case I was based on the effects of single nuclear airbursts assigned to 41 cities in which Corps headquarters are located. All field personnel are assumed to survive. Personnel at two headquarters locations not considered targets (Vicksburg, Mississippi and Hannover, New Hampshire) also are assumed to survive. The weapons used were 1 megaton (MT) for a city within a Standard Metropolitan Statistical Area (SMSA) of less than 2,000 square miles and 25 MT for a city within an SMSA of 2,000 square miles or more. By assuming casualties proportional to population density for a given weapon, casualties for each headquarters were computed on the basis of an example for the effects of the same weapon on Detroit. Overall casualties from using this method amount to roughly 20 percent of the total work force. Figure 10 shows the general computational steps for each headquarters location.

(3) In Case II, the estimated residual work force was based on the effect on the general population of an attack occurring in the mid-1980's. According to a study sponsored in 1979 by the Defense Civil Preparedness Agency (DCPA)^{8/} under the current CD program, fatalities from such an attack

^{8/} DOD, DCPA, High Risk Areas.

CORPS POST-STRIKE RESIDUAL WORK FORCE (Case I)

Corps Element	Peacetime Strength ^{a/}	Percent of Cas/Weapon		Residual Work Force/Weapon ^{b/}		
		1 MT	25 MT	1 MT	25 MT	Mix ^{c/}
<u>OCE Headquarters</u>	1,106	9	63	1,007	409	409
<u>Division/District</u>						
LMVD	281	0	0	281	281	281
Memphis	1,821	15	NF ^{d/}	1,705	NC ^{e/}	1,705
New Orleans	2,434	10	NF	2,297	NC	2,297
St. Louis	1,255	5	36	1,223	1,022	1,022
Vicksburg	<u>2,158</u>	0	0	<u>2,158</u>	<u>2,158</u>	<u>2,158</u>
Total	7,949	--	--	7,664	--	7,463
MED(R)	402	0	0	402	402	402
MRD	349	13	NF	307	NC	307
Kansas City	1,320	7	54	1,264	884	884
Omaha	<u>1,847</u>	13	NF	<u>1,702</u>	NC	<u>1,702</u>
Total	3,516	--	--	3,273	--	2,893
NAD	237	9	70	216	75	75
Baltimore	1,607	9	66	1,528	1,027	1,027
New York	810	9	70	756	390	390
Norfolk	638	30	NF	523	NG	523
Philadelphia	<u>815</u>	6	42	<u>792</u>	<u>657</u>	<u>657</u>
Total	4,107	--	--	3,815	--	2,672
NCD	320	5	40	304	194	194
Buffalo	594	13	NF	546	NC	546
Chicago	673	5	40	658	554	554
Detroit	1,023	26	76	895	650	650
Rock Island	693	12	NF	653	NC	653
St. Paul	<u>1,254</u>	10	71	<u>1,194</u>	<u>831</u>	<u>831</u>
Total	4,557	--	--	4,250	--	3,428
NED	857	20	NF	730	NC	730
NPD	506	6	41	476	300	300
Alaska	435	NT ^{f/}	NT	435	435	435
Portland	1,588	6	41	1,554	1,287	1,287
Seattle	1,061	5	35	1,029	834	834
Walla Walla	<u>760</u>	100	NF	<u>343</u>	NF	<u>343</u>
Total	4,350	--	--	3,827	--	3,199

(Figure 10 Continued on Next Page)

CORPS POST-STRIKE RESIDUAL WORK FORCE (Case I)--Continued

Corps Element	Peacetime Strength ^{a/}	Percent of Cas/Weapon		Residual Work Force/Weapon ^{b/}		
		1 MT	25 MT	1 MT	25 MT	Mix ^{c/}
ORD	300	9	69	273	94	94
Huntington	1,310	14	NF	1,226	NC	1,226
Louisville	1,074	22	NF	956	NC	956
Nashville	1,306	12	NF	1,246	NC	1,246
Pittsburgh	<u>1,237</u>	7	49	<u>1,212</u>	1,063	<u>1,063</u>
Total	5,227	--	--	4,913	--	4,585
SAD	314	12	NF	277	NC	277
Charleston	197	10	72	181	85	85
Jacksonville	1,147	26	NF	1,008	NC	1,008
Mobile	2,829	7	53	2,744	2,183	2,183
Savannah	1,275	45	NF	920	NC	920
Wilmington	<u>519</u>	20	NF	<u>462</u>	NC	<u>462</u>
Total	6,281	--	--	5,592	--	4,935
SPD	223	8	60	206	92	92
Los Angeles	728	5	37	701	525	525
Sacramento	1,096	6	43	1,051	777	777
San Francisco	<u>500</u>	8	60	<u>471</u>	279	<u>279</u>
Total	2,547	--	--	2,429	--	1,673
SWD	311	4	33	299	210	210
Albuquerque	302	17	NF	262	NC	262
Fort Worth	1,443	13	NF	1,337	NC	1,337
Galveston	591	50	NF	425	NC	425
Little Rock	967	14	NF	916	NC	916
Tulsa	<u>1,396</u>	5	39	<u>1,361</u>	1,123	<u>1,123</u>
Total	5,010	--	--	4,600	--	4,273
HND	344	15	NF	292	NC	292
Lab						
WES	1,366	0	0	1,366	1,366	1,366
CERC	154	9	63	140	57	57
CERL	220	20	NF	176	NC	176
CRREL	313	0	0	313	313	313
ETL	<u>299</u>	9	63	<u>272</u>	111	<u>111</u>
Total	2,352	--	--	2,267	--	2,023

(Figure 10 Continued on Next Page)

CORPS POST-STRIKE RESIDUAL WORK FORCE (Case I)--Continued

Corps Element	Peacetime Strength ^{a/}	Percent of Cas/Weapon		Residual Work Force/Weapon ^{b/}		
		1 MT	25 MT	1 MT	25 MT	Mix ^{c/}
Other						
FESA	279	9	63	254	103	103
ESC	<u>47</u>	9	63	<u>43</u>	17	<u>17</u>
Total	326	--	--	297	--	120
Total	48,931	--	--	45,358	--	39,097
				(93%)		(80%)

a/ For divisions and districts, strength figures include field personnel.

b/ Residual work force considers no casualties for division or district field personnel. Although in some instances field offices are located within the same target area as the parent unit, the bulk of field personnel appear to be outside the immediate blast area; therefore, all field personnel are considered outside the blast casualty area.

c/ Residual work force for individual Corps elements based on 25-MT effect where it applies; otherwise, residual work force is based on 1-MT effect (see footnote d).

d/ NF--weapon not fired because 25 MT is considered too large for area.

e/ NC--residual force not calculated.

f/ NT--area not targeted.

Figure 10

would amount to from 60 to 80 percent of the US population. Most of these fatalities would occur in cities. Casualties among Corps employees at headquarters elements located in urban areas were computed as 80 percent--the same as for casualties assumed for the general population in the cities. Because of fallout and other causes of fatalities and injuries, another approximation was computed for Corps field personnel by assuming that 20 percent of these personnel were casualties. Thus, the resulting range of casualties among all Corps employees is between 40 and 50 percent.

d. Summary. One of the major measures of Corps ability to function in a post-attack nuclear environment would be the size of the surviving work force. This residual work force depends on the size of the attack, the available warning time, the CD system in being for reducing vulnerability, and many other uncertain attack parameters. Although a CRP has been accepted as one CD option, its effectiveness depends on several key conditions, one of these being warning time. CRP as an option today is limited to only a few high-risk areas in the country. A broad approximation of the residual Corps work force could range from 50 to 60 percent in one case to 80 percent for an attack in another case in a nuclear attack, with little or no warning, and with the currently available CD posture. However, regardless of the range of possible casualties/survivors, two significant factors stand out: the Corps can expect to have a residual work force and the bulk of that residual work force will be made up of field personnel. This residual work force will not be equitably distributed, and (except for Vicksburg which is not a target area) the significant losses will be of headquarters personnel--OCE, divisions, and districts. This latter fact is particularly significant, since in many cases it will mean that division and district control and functions would fall to field personnel.

Under such circumstances, it would be desirable that these field personnel have some training and even practical experience in managerial roles at a higher level. Also, field personnel should be familiar with the plans of the next higher echelon for post-attack operations. This means that field elements must be brought into direct involvement in the planning process and kept apprised of plan changes.

e. Corps Regional Computer Centers (RCCs). Corps plans for RCCs at Washington, DC and Vicksburg, Mississippi have progressed to where funding is being requested in the FY 81 budget. The importance of two centers surfaces when survivability considerations are studied within the context of the nuclear situation discussed above. It is assumed that should only a single computer site be approved, it would be located in the Washington area because of its proximity to key staff and the Army Headquarters. However, given that Washington is attacked and Vicksburg is not, it is considered necessary to have a second computer site at Vicksburg.

9. Overview. In assessing Corps capability in the three mobilization environments considered in this study, the Corps would have to make major shifts of personnel from current functions to have adequate personnel available for the immediate tasks of full mobilization (the most likely contingency). Such shifts would have to take place quickly and smoothly. To accomplish this effectively will entail considerable cross-training of designated personnel so that they can move into new functions with little or no lost motion. While augmentations of the basic Corps work force are feasible over time, the immediate response to mobilization will have to be borne by that portion of the current work force that can be dedicated to mobilization. In total mobilization (conventional), the same immediate response will have to

be accommodated with the same work force available in full mobilization. Subsequent workload surges can be better scheduled and recruiting of additional personnel can augment the work force. Again, an adequate training program will be necessary. The total mobilization (nuclear) situation not only points out the need for training, but illustrates the necessity for full involvement of all Corps levels in the planning process. A nuclear attack would be most devastating to Corps division and district headquarters. This means that field elements will have to be relied on to take over many Corps functions not normally within their purview. In short, for the Corps work force to effectively handle the requirements of any mobilization, there must be considerable cross-training of selected personnel and the complete involvement of all Corps levels in the planning process.

III. MOBILIZATION REQUIREMENTS

10. General. The Corps' basic requirement in a mobilization situation is to support the military and nation in facilitating those actions deemed vital for national defense and security. Essentially, all elements of the Corps need to be dedicated to providing this support, and in so doing the Corps will have to dedicate all its resources from all but its most essential current functions. However, the Corps must know precisely what is required within the general overall support category to effectively use these resources. Specific requirements will vary among the districts. Defining these requirements will take considerable work by division and district engineers and planners, along with military installation and MACOM commanders and other Federal agencies. However, it is possible here to provide general guidance as to the type requirements to be met and the geographic areas in which those requirements will exist for the three mobilization environments used in this study.

11. Full Mobilization Requirements. Full mobilization is considered the most likely mobilization situation and the one which currently is absorbing the largest planning effort within the military. Additionally, full mobilization would have a major impact on the military force structure within the first 1 to 2 weeks. During this period, many active duty forces are deployed overseas, Reserve elements are activated, and the Selective Service process begins funneling inductees into training centers. This last aspect has required some recent planning changes wherein requirements for Army inductees during the first month of mobilization have been sharply increased. The result has been to place considerable stress on the entire military support structure which will almost certainly evolve into sharply increased requirements

for Corps mobilization support. Not only will military installations be required to be prepared for processing larger numbers of personnel in a shorter time, but the production base will have to meet greater demands for materiel quicker and the transportation infrastructure will have to meet heavier demands. The full significance of these manpower increases has not yet been fully assessed by military planners, but considerable troop restationing will result. As the assessments and new plans are developed, Corps planners at all levels will have to work closely with installation and MACOM commanders to ensure that Corps plans reflect the support requirements generated by the increased force projections. At this time, only to a limited extent do Corps requirements for full mobilization discussed below reflect these new projections.

a. The Army base structure. The current Army documentation on mobilization troop loading at Army bases consists primarily of the FORSCOM Mobilization Troop Basis Stationing Plan and TRADOC's Post Mobilization Individual Training and Support Plan. In October 1979, the latter document was updated to reflect an approximately 30 percent increase in trainees postulated for the first month of a full mobilization in the latest Department of the Army guidance (mid-1979). The impact of this large trainee increase necessitated rebalancing both troop unit and individual trainee stationing plans. A new Mobilization Troop Basis Stationing Plan is scheduled for publication in February 1980. However, additional adjustments, based on policy guidance, are almost certain over time. As adjustments develop and become confirmed in planning, responsible Corps MC districts will have to be provided interim guidance data by the Assistant Chief of Engineers' (ACE) Office which should be fully responsive to MC district planning needs. Based on available

preliminary data (January 1980), it appears that 51 Army bases should be considered primary for mobilization. Figure 11 lists these bases, the responsible MACOMs, their locations, the Corps districts responsible for their support, and their current status. From the listing it can be noted that some of the bases currently are state owned and operated, others only state operated, and others Federally owned and operated but in a semi-active mode. It also should be noted that the list includes installations controlled by the US Army Communications Command (USACC) and Health Services Command (HSC). Corps support of these commands is as essential as that of FORSCOM and TRADOC. These three categories of installations probably will have to have the most Corps support early in mobilization.

(1) Manpower loadings. Annex D provides loading profiles over 180 days of mobilization for seven mobilization installations that represent seven manpower loading patterns. These profiles reflect the mid-1979 documentation. Changes such as the increase in trainee loading probably will cause significant changes at some or many mobilization bases. Fort Campbell is an example of what can happen when the new guidance is fully implemented in the planning. Figure 12 shows the tentative loading profile for Fort Campbell as compared with the one contained in the existing documentation. The major difference between the two profiles results from the change in concept from Fort Campbell serving primarily as a Reserve force assembly area to serving also as a training base. Loading profiles for many installations will show similar changes with the full development of new stationing plans by FORSCOM and TRADOC.

(2) Installation deficiencies. Figure 13 shows the limitations of various Army mobilization posts for supporting personnel in terms of utility

ARMY FULL MOBILIZATION INSTALLATIONS

Installation	MACOM	Location	Responsible Corps District
<u>Active Posts</u>			
Aberdeen PG	DARCOM ^{a/}	Aberdeen, MD	Baltimore
Ft Belvoir	TRADOC ^{b/}	Alexandria, VA	Baltimore
Ft Benning	TRADOC	Columbus, GA	Savannah
Ft Bliss	TRADOC	El Paso, TX	Ft Worth
Ft Bragg	FORSCOM ^{c/}	Fayetteville, NC	Savannah
Ft Campbell	FORSCOM	Hopkinsville, KY	Mobile
Ft Carson	FORSCOM	Colorado Springs, CO	Omaha
Ft Devens	FORSCOM	Ayer, MA	New York
Ft Dix	TRADOC	Wrightstown, NJ	New York
Ft Eustis	TRADOC	Newport News, VA	Norfolk
Fitzsimmons AMC	HSC ^{d/}	Denver, CO	Omaha
Ft Gordon	TRADOC	Augusta, GA	Savannah
Ft Hood	FORSCOM	Killeen, TX	Ft Worth
Ft Harrison	TRADOC	Indianapolis, IN	Omaha
Ft Huachuca	USACC ^{e/}	Sierra Vista, AZ	Sacramento
Ft Hunter Liggett	FORSCOM	Monterey, CA	Sacramento
Ft Jackson	TRADOC	Columbia, SC	Savannah
Ft Knox	TRADOC	Muldraugh, KY	Baltimore
Ft Lee	TRADOC	Petersburg, VA	Norfolk
Ft Leonard Wood	TRADOC	Waynesville, MO	Omaha
Ft Lewis	FORSCOM	Tacoma, WA	Sacramento
Ft McClellan	TRADOC	Anniston, AL	Mobile
Ft Meade	FORSCOM	Baltimore, MD	Baltimore
Ft Monmouth	DARCOM	Red Bank, NJ	New York
Ft Ord	FORSCOM	Monterey, CA	Sacramento
Ft Polk	FORSCOM	Leesville, LA	Ft Worth
Presidio of SF	FORSCOM	San Francisco, CA	Sacramento
Redstone Arsenal	DARCOM	Huntsville, AL	Mobile
Ft Riley	FORSCOM	Junction City, KS	Kansas City
Ft Rucker	TRADOC	Daleville, AL	Mobile
Ft Sam Houston	FORSCOM	San Antonio, TX	Ft Worth
Ft Sheridan	FORSCOM	Evanston, IL	Omaha
Ft Sill	TRADOC	Lawton, OK	Ft Worth
Ft Stewart/Hunter AAB	FORSCOM	Hinesville, GA	Savannah
Ft Story	TRADOC	Virginia Beach, VA	Norfolk
Tobyhanna AD	DARCOM	Tobyhanna, PA	Baltimore

(Figure 11 Continued on Next Page)

ARMY FULL MOBILIZATION INSTALLATIONS--Continued

Installation	MACOM	Location	Responsible Corps District
<u>Semi-active Posts</u>			
Ft Chaffee	TRADOC	Ft Smith, AR	Ft Worth
Ft Drum	FORSCOM	Ft Drum, NY	New York
Ft A.P. Hill	TRADOC	Bowling Green, VA	Norfolk
Ft Indian ^{f/} town Gap	FORSCOM	Lebanon, PA	Baltimore
Ft McCoy ^{f/}	FORSCOM	Sparta, WI	Omaha
Ft Pickett	TRADOC	Blackstone, VA	Norfolk
<u>State-operated Posts</u>			
Camp Atterbury ^{f/}	TRADOC	Edinburg, IN	Omaha
Camp Blanding ^{f/}	FORSCOM	Jacksonville, FL	Mobile
Camp Roberts	FORSCOM	San Miguel, CA	Sacramento
Ft Irwin	FORSCOM	Barstow, CA	Sacramento
<u>State-owned Posts</u>			
Camp Edwards ^{f/}	--	Falmouth, MA	New York
Gowen Field	--	Boise, ID	Sacramento
Camp Grayling	--	Crawford, MI	Omaha
Camp Ripley ^{f/}	--	Little Falls, MN	Omaha
Camp Shelby	--	Hattiesburg, MS	Mobile

SOURCE: DA, USAFORSCOM, HQ, FORSCOM Reserve Component Mobilization Plan.

- a/ DARCOM--United States Army Materiel Development and Readiness Command.
- b/ TRADOC--United States Army Training and Doctrine Command.
- c/ FORSCOM--United States Army Forces Command.
- d/ HSC--Health Services Command.
- e/ USACC--United States Army Communications Command.
- f/ Garrison element required at full activation.

Figure 11

FORT CAMPBELL: MANPOWER LOADING DURING MOBILIZATION

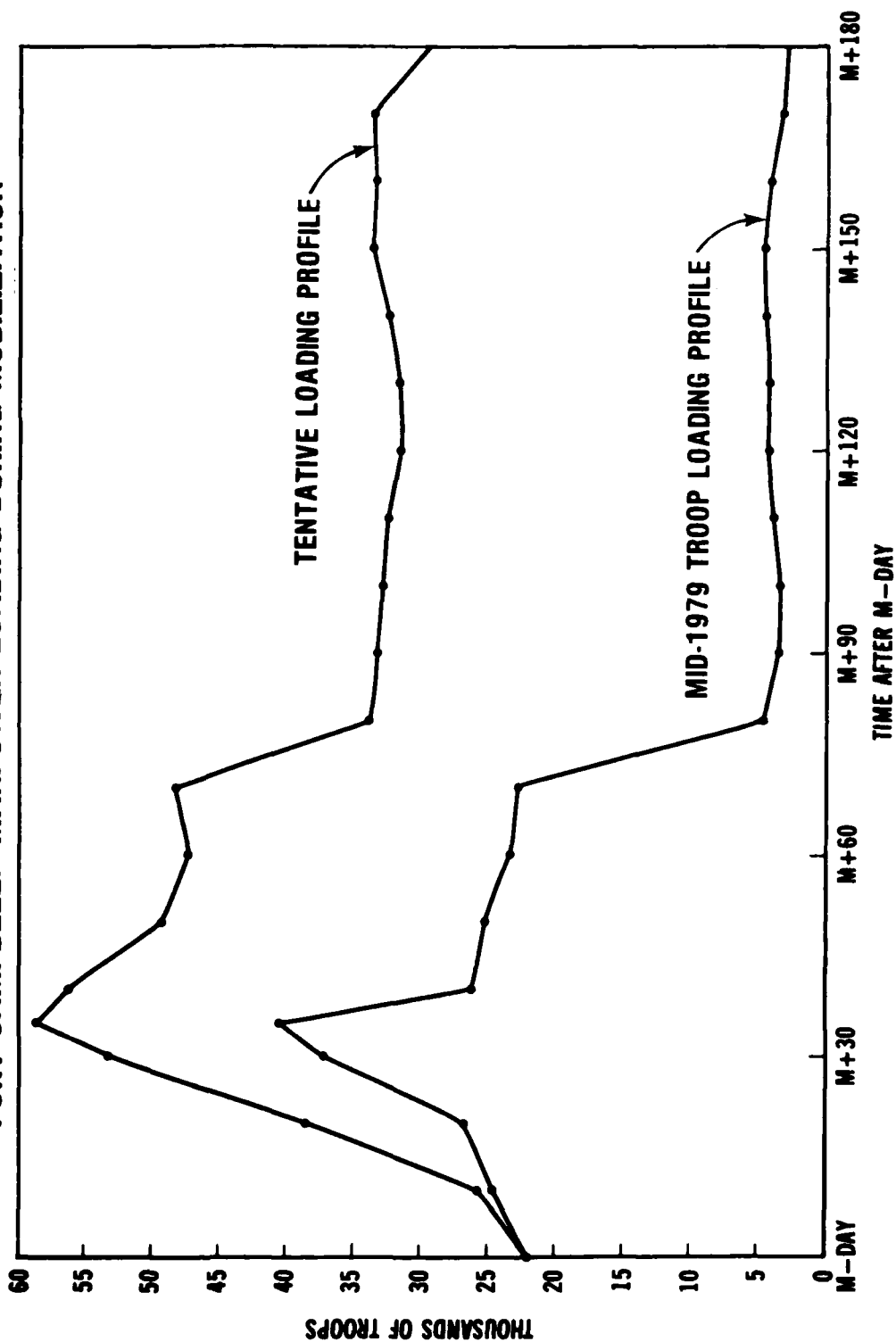


Figure 12

INSTALLATION MOBILIZATION PERSONNEL LOADING AND LIMITATIONS
(Population Rounded to Closest Thousand)

Installation	Facility Capability				Peak Loading ^{c/}			
	BQs ^{a/}	Water ^{b/}	Power ^{b/}	Sewer- age ^{b/}	Early		Subsequent	
					No	Time (M+)	No	Time (M+)
<u>Active Installations</u>								
Ft Benning	23	18 ^{d/}	38	38	31	14	47	105
Ft Bliss	8	30	30	30	14	46	29	178
Ft Bragg	32	90	87	79	42	21	--	--
Ft Campbell	15	49	37	39	31	41	--	--
Ft Carson	17	22	26	22	23	20	--	--
Ft Dix	19	40	40	40	18	40	32	109
Ft Gordon	18	44	60	50	22	30	35	180
Ft Hood	32	75	75	75	52	16	--	--
Ft Jackson	25	34	87	52	27	98	--	--
Ft Knox	27	25	60	50	43	29	44	86
Ft Leonard Wood	28	50	50	50	24	24	37	180
Ft Lewis	25	33	30	23	--	--	26	133
Ft McClellan	9	25	25	25	11	49	--	--
Ft Polk	27	38	32	27	28	18	--	--
Ft Riley	13	24	45	28	20	20	--	--
Ft Rucker	.5	25	17	25	17	24	--	--
Ft Sill	14	42	42	42	--	--	24	115
Ft Stewart/Hunter	13	38	34	54	32	24	--	--
<u>Semi-active Posts</u>								
Ft Chaffee		17	14	27	17	40	--	--
Ft Drum		37	35	16	26	60	--	--
Ft McCoy		35	40	45	23	40	--	--
<u>State-operated Posts</u>								
Camp Roberts		17	30	10	8	34	--	--
Ft Irwin		10	16	10	12	16	--	--

a/ BQ--bachelor quarters. Source: Army Housing Office compilation of field-submitted DA-1709R reports (see footnote a, Figure 14).

b/ Source: DA, USAESC, Review of Division and Brigade Stationing.

c/ Source: DA, USAFORSCOM, HQ, Mobilization Troop Basis Stationing Plan and DA, TRADOC, Post Mobilization Training and Support Plan (as of mid-1979).

d/ Theoretically, capability will not support current population, so water support capability obviously exceeds what was reported.

NOTE: Underlined capability would be limiting under mobilization; must plan to overcome. For housing spaces, shortages may not be as severe as indicated at most installations since on-post family housing is not included (see Figure 14). Also, off-post housing is not considered, but obviously is a factor in some cases. The Army Housing Office is making some attempt to determine the extent of off-post housing at some installations.

Figure 13

capacity (e.g., power, water, sewerage). The data on these installations were taken from the Review of Division and Brigade Stationing, a study done by ESC in 1977. In doing the study, questionnaires were sent to installation commanders soliciting their assessment of installation capability for troop support. While the data for these posts may be somewhat dated, they do indicate some serious deficiencies in installation support capability that would have to be overcome if the installations were to be able to accept even those troop increases scheduled under the current mobilization stationing plans. Installation surveys currently in progress should refine such data and provide MC district planners with better guides as to what will be needed to bring installations and facilities up to standards that will support expected personnel influxes.

(3) Billets. Currently there is considerable emphasis on assessing installation personnel capacity using barracks space as a gauge. While barracks (or billet) space is not the only criterion for installation capacity, it is one measure for which data are available. The Army evaluation system for installations formulated in AR 210-23, Master Planning for Army Installations--Emergency Expansion Capabilities, when fully implemented will permit developing complete installation capabilities profile analyses. Such profiles could then be used by Corps district planners to evaluate Corps workloads. However, until the AR 210-23 profiles are fully developed, billet space data can provide Corps planners one usable workload measure. Figure 14 lists the mobilization installations, their current billet capacities, and the expected peak personnel loads in full mobilization using the mid-1979 stationing plans. Admittedly, billet space shortages revealed by comparing barracks space with installation population are somewhat misleading, since at most

HOUSING ASSETS OF SELECTED MOBILIZATION POSTS

	BEQ ^a /	Substan- dard BEQ ^b /	BOQ ^a /	Substan- dard BOQ ^b /	Total Bachelor Housing ^c	Family Quarters	Mobilization Peak Military Population ^d
Active Installations							
Aberdeen Proving Ground	1,492	1,437	197	2	3,128	1,404	12,870
Fitzsimons Army Medical Center	561	588	205	0	1,354	289	300
Fort Belvoir	2,731	0	197	0	2,928	1,655	6,973
Fort Benjamin Harrison	778	0	230	0	1,008	355	7,019
Fort Benning	13,919	7,704	904	0	22,527	4,096	46,528
Fort Bliss	7,229	0	922	68	8,219	3,582	31,794
Fort Bragg	19,409	11,728	1,094	0	32,231	4,842	41,588
Fort Campbell	12,178	2,428	339	0	14,999	4,155	40,656
Fort Carson	11,903	4,342	371	103	16,719	1,907	24,618
Fort Devens	4,434	4,752	273	6	9,465	1,728	24,446
Fort Dix	18,330	0	492	10	18,832	2,193	31,700
Fort Eustis	10,763	1,357	581	7	12,708	1,503	9,542
Fort Gordon	17,363	836	198	0	18,397	878	34,957
Fort Hood	25,488	5,051	301	793	31,633	5,241	51,686
Fort Huachuca	3,073	2,207	241	20	5,541	2,056	6,742
Fort Hunter Liggett	1,527	0	6	0	1,533	9	0
Fort Jackson	18,292	6,116	158	9	24,575	1,149	27,196
Fort Knox	13,322	13,160	416	15	26,913	4,372	43,811
Fort Lee	5,233	1,707	260	30	7,230	1,469	17,923
Fort Leonard Wood	20,157	7,045	443	168	27,813	2,944	36,511
Fort Lewis	11,848	12,399	582	70	24,899	3,577	26,160
Fort McClellan	8,756	152	269	15	9,192	571	11,309
Fort Meade	2,536	567	246	50	3,399	3,130	15,616
Fort Monmouth	2,442	0	84	0	2,526	1,167	6,524
Fort Ord	10,999	1,920	130	69	13,118	4,277	28,946
Fort Polk	8,927	16,149	300	1,338	26,714	1,765	27,810
Fort Riley	10,078	2,513	465	0	13,056	3,183	19,864
Fort Rucker	442	0	111	0	553	1,522	17,184
Fort Sam Houston	5,397	953	668	0	7,018	1,172	17,356
Fort Sheridan	132	692	2	45	871	773e/	3,559
Fort Sill	12,966	590	576	0	14,123	1,417	23,645
Fort Stewart/Hunter AFB	11,780	640	60	25	12,505	2,375	31,615
Fort Story	0	1,577	0	39	1,616	164	1,288
Presidio of San Francisco	256	1,105	208	61	1,630	1,176	4,895
Redstone Arsenal	806	176	66	0	1,048	1,171	4,678
Tobyhanna Army Depot	223	0	9	0	232	42	1,028

(Figure 14 Continued on Next Page)

HOUSING ASSETS OF SELECTED MOBILIZATION POSTS--Continued

	BEQ ^a /	Substan- dard BEQ ^b /	BOQ ^a /	Substan- dard BOQ ^b /	Total Bachelor Housing ^c /	Family Quarters	Mobilization Peak Military Population ^d /
<u>Semi-active Installations</u>							
Fort A. P. Hill	44	0	0	0	44	3	6,534
Fort Chaffee	0	0	0	0	0	0	17,334
Fort Drum	399	14,009	0	1,236	15,644	92	25,552
Fort Indiantown Gap	188	150	39	40	417	13	22,257
Fort McCoy	0	0	0	0	0	126	22,637
Fort Pickett	88	4	0	0	92	7	13,962
<u>State-owned or -operated Installations</u>							
Camp Atterbury	--	--	--	--	--	--	9,644
Camp Blanding	--	--	--	--	--	--	95
Camp Edwards	--	--	--	--	--	--	8,806
Camp Grayling	--	--	--	--	--	--	21,675
Camp Ripley	--	--	--	--	--	--	14,159
Camp Roberts	--	--	--	--	--	10	8,230
Camp Shelby	--	--	--	--	--	--	18,434
Fort Irwin	547	0	60	0	607	506	11,992
Gowen Field	--	--	--	--	--	--	2,493

^a/ BEQ--bachelor enlisted quarters. The data on unaccompanied officers and enlisted quarters is taken from a listing prepared by the Army Housing Office based on the DA-1709R reporting formats provided by the field. The unit of measure used is basically 78 square feet living space for BQs used by recruits, and 90 square feet living space for other BEQs. The data on BEQs were completed in December 1979; however, the Army Housing Office questions its accuracy. The data on BQs were completed in November 1979 and are considered accurate.

^b/ BOQ--bachelor officer quarters. Totals in this column list substandard quarters which it is infeasible to make adequate. The majority of these are World War II barracks.

^c/ Data in this column are the totals of the preceding four columns.

^d/ The peak military population accruing during the period M-day to M+180 based on DA, USAFORSCOM, HQ, Mobilization Troop Basis Stationing Plan and the DA, TRADOC, Post Mobilization Individual Training and Support Plan (mid-1979 plans).

^e/ Includes 253 units of Wherry Housing, privately owned and managed.

Figure 14

bases a certain percent of the personnel live off post. Thus, in the very initial stages of mobilization there may actually be more billet spaces available than indicated. However, billet shortages indicated in Figure 14 do become meaningful as active forces are deployed and Reserve component elements and trainees come to constitute the bulk of installation population. These elements will have to be housed on the installations. Therefore, while any initial billet space deficiencies may not be as severe as indicated, they could become increasingly severe as mobilization progresses.

(4) Corps workload requirements. To support military installation commanders in mobilization, Corps MC districts must be prepared to immediately expand or enhance those installation facilities which prevent the installations from handling their expected personnel loads. Such expansion or enhancement will have to be done as expeditiously as possible, since initial peak loads occur early in mobilization. Tents may have to be used to augment billet spaces, temporary sewage collecting ponds may have to be excavated and lined, and other expedient measures taken. These measures should be planned in advance of mobilization, and the MC districts should have HND's full support in developing expedient measures. Additionally, the Corps may be responsible for real estate (RE) acquisition or leasing at some installations where training areas need to be expanded. The adequacy of training areas depends on troop population, the level of training to be provided, and the type units to be trained. This monograph does not attempt to assess training areas because the relevant planning is not sufficiently developed. However, the ACE's Office should keep the MC district planners fully aware of projected training assignments as they are developed so real estate actions can be planned. In addition to the installation requirements, MC district planners may have to be

prepared to enhance transportation links connecting installations to primary transport arteries. The Military Traffic Management Command (MTMC) has surveyed rail facilities and many highway arteries in CONUS in terms of adequacy to handle mobilization traffic. In general, the primary systems have been found adequate, but there appear to be deficiencies in some rail and highway links connecting facilities and installations. Again, it should be the responsibility of MC district planners (in conjunction with the ACE and possibly MTMC) to assess routes to installations, determine needs for upgrading or enhancement, and plan for expedient route improvements where warranted.

b. The production base structure. Similar to troop bases, production base installations will be called on to immediately increase capacity and output in a mobilization. This is particularly true with the increased manpower loading planned in the first 30 days. Enhancement of the production base will be largely the responsibility of the Corps working in concert with DARCOM, which has primary production base responsibility. The amount of Corps effort required at each facility has not been quantified. However, DARCOM has indicated the type work needed at a number of facilities (see Annex D). Figure 15 lists 48 primary Army-owned production facilities, their locations, and the responsible Corps district. Corps planners should actively work with the responsible installation managers or DARCOM representatives to obtain the necessary data to quantify support plans for each installation. When mobilization is declared, the types of Corps work needed include planning for expansion/renovation/rehabilitation, surveying, design work, and construction management. Corps planners must expect a heavy demand for support in this area until all requirements have been identified and quantified at each production base facility. Activating currently inactive ammunition plants and

PRIMARY ARMY-OWNED PRODUCTION BASE FACILITIES

Installation	Location	Contractor	Responsible Corps District
<u>Active Ammunition Plants</u>			
Crane	Crane	GOGO ^a /	Omaha
Hawthorne	Hawthorne	GOGO	Sacramento
McAlester	McAlester	GOGO	Ft Worth
Holston	Kingsport	Holston Defense Corp	Mobile
Indiana	Charlestown	ICI United States, Inc.	Omaha
Iowa	Burlington	Silas Mason Co, Inc.	Omaha
Kansas	Parsons	Day & Zimmerman, Inc.	Kansas City
Lake City	Independence	Remington Arms Co, Inc.	Kansas City
Lone Star	Texarkana	Day & Zimmermann, Inc.	Ft Worth
Long Horn	Marshall	Thiokol Chemical Corporation	Ft Worth
Louisiana	Shreveport	Thiokol Chemical Corporation	Ft Worth
Milan	Milan	Martin Marietta	Mobile
Radford	Radford	Hercules, Inc.	Baltimore
Riverbank	Riverbank	Norris Industries, Inc.	Sacramento
Scranton	Scranton	Chamberlain Manufacturing Corp	Baltimore
<u>Inactive Ammunition Plants</u>			
Alabama	Childersburg	Olin Corporation	Mobile
Badger	Baraboo	Olin Corporation	Omaha
Cornhusker	Grand Island	Mason Company, Inc.	Omaha
Gateway	St. Louis	Voss Machinery Company	Kansas City
Hays	Pittsburgh	Zell Brothers, Inc.	Baltimore
Joliet	Joliet	GOGO	Omaha
Newport	Newport	Uniroyal, Inc.	Omaha
Phosphate Development Works	Sheffield	TVA	Mobile
Ravenna	Ravenna	Ravenna Arsenal, Inc.	Baltimore
St. Louis	St. Louis	Donovan Construction Company	Kansas City
Sunflower	Lawrence	Hercules, Inc.	Kansas City
Twin Cities	New Brighton	Federal Cartridge/Donovan Construction/Honeywell	Omaha
Volunteer	Chattanooga	Imperial Chemical Industries of US, Inc.	Mobile
Burlington	Burlington	Voss Machinery Company	New York

(Figure 1.5 Continued On Next Page)

PRIMARY ARMY-OWNED PRODUCTION BASE FACILITIES--Continued

Installation	Location	Contractor	Responsible Corps District
<u>Arsenals</u>			
Redstone	Huntsville AL	Raytheon Co	Mobile
Pine Bluff	Pine Bluff AR	GOGO ^{a/}	Ft Worth
Edgewood Area, APG	Aberdeen MO	GOGO	Baltimore
Detroit Tank Plant	Warren MI	Chrysler Corp	Omaha
Picatinny	Dover NJ	GOGO	New York
Watervliet	Watervliet NY	GOGO	New York
Frankford	Philadelphia PA	GOGO	Baltimore
Rocky Mountain	Denver CO	GOGO	Omaha
Rock Island	Rock Island IL	GOGO	Omaha
<u>Proving Grounds</u>			
Jefferson	Madison IN	GOGO	Omaha
Aberdeen	Aberdeen MD	GOGO	Baltimore
Dugway	Dugway UT	GOGO	Sacramento
<u>Missile Plants</u>			
Tarheel	Burlington NC	Western Electric	Savannah
Michigan	Sterling Hgts MI	LTV Aerospace Corporation	Omaha
<u>Miscellaneous</u>			
Lima Army Modification Ctr	Lima OH	Chrysler Corporation	Baltimore
Weldon Springs Army Cml Plant	Weldon Springs MO	GOGO Inactive	Kansas City
Saginaw Army Aircraft Plant	Saginaw TX	Textron Inc/Bell Helicopter Co	Ft Worth
Stratford Army Engine Plant	Stratford CT	Avco Lycoming Division (Modernization)	New York
Carbonyl Iron & Nickel Plant	Huntsville AL	GAF Corporation	Mobile

a/ GOGO--Government-owned, Government-operated.

Figure 15

bringing all plants to full capacity will involve a major Corps effort in itself. In addition to the facilities, the connecting transport links to the facilities in most cases require major improvements. This is particularly true at some proving grounds, ammunition storage facilities, and currently inactive ammunition plants.^{9/} Both road and rail links would have to be upgraded at such installations, with rail sidings and spurs at ammunition plants probably of highest priority.

c. Other military services. The US Air Force (USAF) and US Navy indicate that they do not foresee any additional Corps support for their installations or facilities during mobilization. USAF policy is such that any major overloading of installations through activation of Reserve components is not expected. Any short-term overloading of installation billets that should occur would be handled through the rental of commercial housing facilities adjacent to the installation(s) concerned. In the procuring of such rental facilities, the USAF could require Corps assistance. Currently, the USAF is reviewing its mobilization loadings in conjunction with its installation facilities to ascertain if such rentals will be needed. For the USAF production base, no Corps support is envisioned since USAF policy, as delineated in AFR 78-22,^{10/} specifies that enhancements or increases in the production base will be accomplished through increased funding of contractors. No increased Corps support of the Navy is foreseen in expansion or refurbishment of Naval facilities. However, the Corps planners should be aware that more intense

^{9/} DARCOM does have a multi-billion-dollar, 10-year ammunition plant modernization program underway, and the Corps is involved in the program. However, budgetary restraints in the past have prevented rapid progress in this area. Thus, in the event of mobilization, much of the work first postulated to be completed in the 1970-1980 time frame would have to be accomplished quickly following a mobilization declaration.

^{10/} DAF, HQ, AFR 78-22, Management of Industrial Facilities.

port usage, not only by Naval units but also by transports, may result in increased requirements on the Corps dredge fleet as discussed below.

d. Dredging and port activity.^{11/} The Corps can expect significant dredging workloads in support of defense emergencies. Dredging will constitute a key mission at both CONUS and OCONUS ports, along access-egress channels, and at various anchorages. The current conditions of many authorized channels and harbors (in CONUS) will dictate extensive dredging requirements during mobilization. Reduced channel widths and shallower depths than those authorized (or considered safe in the case of reduced widths) are commonplace. It should be noted that where these conditions now exist, certain time and cost penalties are involved because of increased transit times or light loading of some vessels. Such penalties will not aid mobilization efforts. Therefore, extensive maintenance dredging should be planned for (both by contract and government plant) early during mobilization. New construction is also envisioned where turning basin extensions or new channels are required; this would be done to accommodate longer vessels or to expand certain ports. All dredging activity can most expeditiously be accomplished if planning is completed by the regional centers of competence being established. In addition to the dredging activity, Corps support may be required in expanding port facilities. This need was indicated in the Nifty Nugget exercise (MOBEX 78) which noted a shortage of piers and berths for loading ammunition. The Corps would be needed for its management capability and to make appropriate real estate actions.

^{11/} DA, USAESC, National Security Aspects of the Federal Dredge Fleet.
DA, OCE, Water Resr Spt Ctr, Non-Hopper Dredge Requirements of the
US Army Corps of Engineers Minimum Fleet.
Hopper Dredge Requirements of the US Army Corps of Engi-
neers Minimum Fleet.

e. Centralized real property maintenance activities (RPMA). There is a case that can be made for the Corps or some wartime successor command to assume responsibility for centralized RPMA or RPMA/industrial operations for all or most installations in CONUS under mobilization conditions. A trial of centralized RPMA is now underway in the National Capital Region. The incentive for doing this in a mobilization is that the major troop installations will move major tenant units (e.g., III Corps, Fort Hood; 4th Infantry Division, Fort Riley) with serving Commanding Generals (CGs) overseas. The outgoing CG and his successor will have much to do without having to maintain responsibility for the installation(s) he commands in peacetime. It may be logical to move to a centralized RPMA (or RPMA/industrial operations) under the command or direct cognizance of the Corps (or successor agency) during emergencies. This recommendation can await earlier mobilization planning, perhaps to include MOBEX 80. The ultimate use of the 416th Engineer Command should recognize this possibility. Some installations which continue (or build on) their peacetime missions in an emergency (Fort Benning, West Point, Rock Island) may continue the peacetime relationship essentially, perhaps modified to strengthen the interface between the FE and the Corps field organization. This concept of a centralized RPMA will be the subject of future study and various alignments will be explored.

f. Summary. Corps immediate planning needs center around planning to meet those requirements incurred by the military and the nation in full mobilization. The all-to-limited planning throughout the military for meeting full mobilization has been recognized at all levels and corrective action is now receiving considerable impetus from the highest levels. Additionally, the problem has been even further stressed by new and higher manpower goals set by

the Army for the early phase of full mobilization. Within a full mobilization period, the crucial reaction time is within the first few days, and it is in this time that Corps districts must act to provide the necessary support. Primary Corps requirements will initially fall into three broad categories: military base structure support, production base support, and transport route support.

(1) Military base structure support. It is clear that the situation in terms of defining precise requirements and workloads is in a status of flux as new troop loadings for bases are being assessed and planned. However, from data available, it appears that most military installations will have to have expanded facilities to accommodate expected troop influxes. With peacetime construction funds limited, most such enhancements would have to take place in the initial days of mobilization. This will require precise advance planning by Corps districts, including plans to use the most expeditious measures possible to overcome any deficiencies. The use of temporary housing, such as tents, is one area in which expeditious measures will have to be employed. This planning will require that the ACE's Office continually keep district planners informed of stationing decision developments and installation surveys. Also, HND should work with Corps district planners to ensure that they have the latest standards for expedient construction at their disposal.

(2) Production base support. With manpower levels early in the mobilization period projected to be higher than previously planned, there is increased pressure on the production base for materiel. The current condition of some of that production base, particularly ammunition plants, raises questions as to whether increased production goals can be met without considerable

early enhancement. Corps planners need to plan for the provision of early support to the production base. This will require that Corps planners coordinate continuously with DARCOM representatives. Installation expansion plan surveys of DARCOM installations should be undertaken immediately so that the necessary data are available for Corps planners and so that installation expansion is not delayed when a mobilization is declared.

(3) Transport route support. From preliminary data, it appears that Corps support will be needed early-on in mobilization to enhance some transport facilities. Of first priority are some rail sidings and spurs at production base facilities, particularly ammunition plants and some troop bases. Plants requiring high consideration are those that currently are inactive but for which there are plans to bring them on line when mobilization is declared. Ports are the other major transport route area for Corps support. At key ports, Corps support will be needed to maintain adequate channel depths and widths, turning basin depths, and alongside depths. Corps support will be required at ports slated to be used for ammunition shipments to acquire additional real estate for constructing and probably for managing the construction of ammunition piers. The safety standards for handling ammunition require separate port facilities from those for general cargo. There will be a need to expand port capability for increased ammunition shipments in a mobilization situation.

12. Total Mobilization (Conventional) Requirements. The declaration of a total mobilization (conventional) state by the President and Congress would require the dedication of all the nation's resources to the defense effort. Military strength would be increased significantly beyond that of full mobilization with the creation of new units. Initial estimates of Army strength

increases are that the Army's size would be increased to about 6 million in 4 years after declaration of mobilization. The amount of resources dedicated to mobilization and the increased military force are two major differences between full and total (conventional) mobilizations. Another significant difference is the expected length of the two. Most planning for full mobilization is in terms of a 180-day period (although it is possible that this would be extended if conditions warranted). Total mobilization (conventional), on the other hand, is thought of in terms of years, and probably would result from a deteriorating full mobilization military situation. For purposes of this study, the total mobilization (conventional) situation is assumed to begin 30 days after full mobilization has been in effect. Most defense planning to date focuses on full mobilization because it is considered the most likely mobilization to occur and the most immediately demanding. Planning for total mobilization (conventional) is embryonic at best throughout the military structure. This is partly because most planners feel that at least the first 6 months of total mobilization would be identical to full mobilization. The reason for this is that the Selective Service System is not expected to provide additional people beyond replacements and fillers for existing units to permit the creation of new units. Also, the production base is not expected to be able to begin producing the excess materiel needed for equipping new units until after 6 months. In fact, estimates are that it will be nearly 2 years after total mobilization is declared before a new heavy armored unit can be fielded. This may be an overly pessimistic assessment of national capability, but it does point up limitations of the production base. However, despite these current views of total mobilization and the limited

planning done to date, some guidance can be offered for Corps planners who must develop support plans.

a. Installation support requirements. Planners have not identified Army installations that would be used in total mobilization (conventional) as bases for training and new unit formation. However, it appears logical to assume that the same base structure used in full mobilization will be used in total mobilization. Thus, there would be identical deficiencies existing at these installations requiring Corps support. Early correction of deficiencies to take care of the initial surge of personnel in full mobilization will help make the installations capable of handling the total mobilization personnel loadings. However, it is anticipated that personnel buildup will begin to exceed full mobilization loadings by M+200. This may require additional Corps support to upgrade installations. A big difference would be that full mobilization requires the most expedient measures to overcome deficiencies immediately. Any additional measures required for enhancing installations for total mobilization could be accomplished with more permanent construction. For example, barracks, rather than tents, could be constructed for troop housing. Also, the longer lead times will permit replacing expedient type construction with the more permanent facilities. However, despite longer lead times, Corps planners should have basic support plans ready prior to any declaration of total mobilization (conventional), just as plans should be on the shelf for full mobilization. Although there are no stationing plans for a total mobilization, Corps planners should be prepared to work with installation and MACOM commanders as the planning proceeds. Because total mobilization planning is in initial stages, Corps planners can have a major influence in developing and structuring the plans to ensure optimum use of resources and time.

b. Production base support requirements. From initial capability estimates now available, the inability of the production base to produce materiel to equip and supply new units appears to be the primary constraint on expanding the military forces for total mobilization. As in full mobilization, Corps support will be needed to expand the production base and activate inactive facilities. It requires a certain amount of time to bring any cold production line to hot-line status, and every effort is needed to reduce this conversion time. Additionally, new plants, (e.g., tank turret foundries) will have to be constructed and activated. These tasks will be major in their workload implications. While Corps support for the production base facilities can be foreseen during full mobilization, the indications are that much more intense and prolonged support would be needed during total mobilization (conventional).

c. Transportation facility support requirements. The Corps should expect even greater responsibility for enhancing transport links during total mobilization than in full mobilization. Besides constructing or rehabilitating rail and road links to installations and production plants, the Corps probably would become more involved in work on primary road and rail lines. Primary highway and rail lines are generally within the purview of private concerns, the states, or the Department of Transportation (DOT). However, correspondence between the DOT Director of Emergency Transportation and the Corps Director of Civil Works^{12/} suggested the Corps plan for support of the civil highway network. Specifically, Corps support was suggested for relief of chokepoints such as bridges or blocked tunnels. In total mobilization (conventional) the increased use of some routes for moving large amounts of

^{12/} DOT, Dir of Emerg Trans, Ltr to Dir of CW, OCE, no subj, 25 Sep 79.

war materiel and troops could cause breakdowns necessitating rapid Corps response. Thus, Corps support for land transportation facilities in total mobilization could become far greater than in full mobilization. Corps support requirements for maintaining navigable waterways and port maintenance and support also are likely to be greater in total mobilization (conventional) than in full mobilization. The MTMC study of waterways^{13/} provides a good assessment of waterway capability in CONUS. Despite the fact that no current contingency plan specifies inland waterway use during mobilization, such use should be expected. Additionally, the capability of some waterways may need to be increased. Thus, the dredging activities specified for full mobilization could become more intense and probably more extensive. This is particularly true once the creation and deployment of new units begin and waterborne cargo and troop movements become more intense. Also in this period, additional ports probably would be used to avoid concentrating movements around one area. Additional ports will mean further expansion of Corps workload not only in port maintenance, but probably also for facility expansion.

d. Other services' support requirements. Corps support requirements for the USAF and Navy have not been identified for total mobilization (conventional). As these military services expand their size with new units, their need to expand CONUS base structures also would increase. This would probably entail Corps support for real estate actions and for construction management activities. Better identification of these support tasks will have to be developed at the local level.

^{13/} DA, USAMTMC, An Analysis of CONUS Inland Waterways for National Defense.

e. Summary. There is essentially no quantitative guidance for Corps planners for total mobilization (conventional) because there is no definitive planning throughout the military structure on this subject. Some initial insights are possible only from a broad assessment of expected Army expansion over a 4-year period. Corps workload requirements in total mobilization (conventional) initially would be the same as for full mobilization. However, it can be foreseen that the workloads would be expanded both in scope and duration as the mobilization condition continued and expanded. Thus, while Corps planners need to give their highest priority to planning for full mobilization, they need to devote effort also to planning for total mobilization (conventional).

13. Total Mobilization (Nuclear) Requirements. Moving from a conventional military mobilization--either full or total--into a nuclear situation is a major step into the unknown. There are no experience data reflecting what such a situation would be like, and only limited data from relatively small samples on the possible impacts of such an attack. There are numerous studies postulating nuclear attacks on CONUS. But, there are difficulties in deciding whether one hypothetical situation is any more valid than another because of the almost countless possibilities involved in postulating such attacks. Still, there is a need to provide planners with a framework in which to initiate planning efforts since the possibility of a nuclear war continues to exist. Although planning for recovery from a nuclear strike against CONUS has been at a low level for a number of years, interest appears to have revived with the President's formation of the FEMA and designation of a CRP. Since Corps elements at various levels will be working with FEMA and local officials in developing more detailed plans, Corps division and district planners need to initiate planning activities within the Corps that will ensure

maximum Corps responsiveness to a nuclear attack. Annex C describes in some detail both a possible nuclear environment and an appropriate Corps response. This annex is the only place in the report that outlines the potential Corps response. In developing Corps plans for total mobilization (nuclear), Corps planners need to plan for two distinct periods--the pre-attack period and the post-attack period. If the worst-case situation occurs (i.e., attack without warning), then there obviously would be no Corps pre-attack requirements. However, with some warning, even a few days, some critical actions can be taken to reduce the effects on the population and to help in the recovery period. Corps requirements are discussed below in the two time periods.

a. Pre-attack requirements. Most planning being done to date envisions some period of tension before a nuclear attack, and there are regulations which direct the Corps to respond to civil and military needs in a nuclear situation. The first priority response in such a situation is to survival. Once these needs are satisfied to the extent that local agencies can assume control, the Corps will be available to support the military where required. Requirements to meet these support needs are the basis for the Corps developing contingency plans that are consistent with local plans and in concert with FEMA's national plans. Should an international situation deteriorate to the point that an attack becomes likely or imminent, Corps resources can be used to help actuate some of the planning that has been developed. Crisis relocation, for example, calls for evacuating the populace from high-risk areas to host areas that would be outside the range of weapons effects. Corps locations, such as recreational areas, are obvious places in some cases to serve as host areas. Corps personnel could assist with such evacuation and also with the other attendant functions involved in caring for evacuated

people. Additionally, Corps elements could be instrumental in assembling construction equipment that would be needed in a post-attack environment. Assembly areas would be away from high-risk areas. The Corps would be responsible for ensuring the continuing operations of key or vital Corps facilities in both pre-attack and post-attack situations.

b. Post-attack requirements. In a post-attack environment, there would be a multitude of tasks to be accomplished to ensure national survival and recovery. Every Federal and local agency would have to contribute its efforts. The Corps has certain in-house capability for such tasks as radiological monitoring and communications. Additionally, Corps capability in all areas of construction management enables the Corps to assess damage, prioritize tasks requiring construction resources, determine availability of construction resources, and direct the use of those resources. Corps planning for expedient measures to meet full mobilization requirements also could be applied in a post-attack environment. For example, expedient housing, such as tents, could serve as shelter for attack survivors; expedient sewerage systems could help alleviate sanitation needs; and potable water sources could be developed. DOT has already indicated Corps assistance in clearing chokepoints on primary transportation links. Here, Corps knowledge of emergency bridging and bypass construction would be invaluable. The Corps' undertaking of any of these tasks would depend on the size and imposition of the Corps residual work force as discussed earlier. However, employment of that work force can only be effective if there is advance planning and the personnel are aware of their responsibilities under these circumstances.

IV. PLANNING FOR MOBILIZATION

14. General.

a. To provide the support expected of it by the military and the nation, the Corps must develop mobilization plans that reflect detailed analyses of likely Corps workload requirements and capabilities in mobilization situations. Such plans must be viable and dynamic documents that are continually reviewed and periodically exercised to ensure their appropriateness and adequacy. Moreover, all Corps elements must be fully cognizant of plan contents and every individual must know his/her function under these plans. Training will require continuing efforts. Past exercises (e.g., MOBEX 78) have indicated a lack of adequate mobilization planning within the Corps and an unfamiliarity with mobilization requirements. A new and growing awareness throughout the military structure is bringing mobilization planning to the fore and the Corps needs to be a vital and integral part of that planning.

b. Corps mobilization plan development is a process which must recognize all the many requirements and customers. As important, the process needs to recognize some of the Corps' unique characteristics such as its decentralized mode of operations. Corps mobilization requirements will vary considerably by customer, geographic area, and time period. These varying requirements and Corps structure prevent developing standard mobilization plans that will fit every Corps element. Rather, each Corps element will have to develop plans that reflect that element's unique characteristics and responsibilities. While planning should reflect the Corps' uniqueness, general guidelines on basic plan content and concepts can be specified.

15. Planning Requirements and Concepts. Annex E of this monograph describes in some detail basic concepts for Corps mobilization planning at the

various Corps organizational levels. This annex should be reviewed carefully by Corps planners as a guide. Some key points need to be stressed relative to mobilization planning.

a. Overall requirements.

(1) With the increased stress put on mobilization planning throughout the military, advance planning is the Corps' most immediate need. In prioritizing efforts, the focus initially should be on full mobilization, followed by planning for total mobilization (conventional). While planning for total mobilization (nuclear) generally should be considered a third priority, it must be recognized that some effort in this area will take place concurrently with full mobilization planning. This results from requirements on the Corps to work with FEMA and local officials in helping to develop segments of FEMA plans, particularly in determining assets potentially available in a nuclear environment.

(2) This monograph seeks to quantify Corps capabilities and Corps mobilization requirements to the extent possible in a mobilization environment. However, such quantification, even for full mobilization, can only be in general terms. The Corps elements responsible for carrying out each mission must determine specific workloads at specific locations to be met by specified personnel. Thus, each Corps level having a mobilization planning mission must conduct its own analyses of workloads and capabilities within its area of responsibility.

(3) In the past, the Corps has not given mobilization planning priority attention. There is a real requirement to correct this deficiency. In order to conduct adequate mobilization planning, the resources in terms of money, manpower, and time need to be allocated specifically to such efforts at

all Corps levels. These resources must be programmed into annual budgets and work programs.

(4) Mobilization plans that are developed need to be exercised and evaluated both within internal Corps mobilization exercises and in Army- and DOD-wide exercises. Such periodic exercises will test plan viability and heighten the awareness of participants as to the rapid response requirements involved under national mobilization conditions.

(5) Because so many of the Corps' personnel resources are concentrated in civil functions, there is a need at all Corps levels to determine who the key personnel would be in mobilization and ensure that those personnel have the cross-training to effectively switch functions. This means that adequate training programs must be developed and personnel scheduled for them on a regular basis. Immediate response requirements negate the opportunity for on-the-job training of key people once mobilization is declared.

b. Planning concepts. Within the conceptual base for planning, there are some key elements that must be included in plan formulation. Fundamental among these elements is the concept of "one-stop" service. Despite the Corps' internal structure, external customers (such as military installation commanders) must have a single Corps source for support. This requirement establishes the necessity for a lead district for a given geographic region that will serve as a single point of contact for any customer within that region. Within the Corps, the establishment of "one-stop" service dictates that there be total vertical and lateral communications networks between the lead district and all elements that must support that district. In concert with this must go the clear assignment of authority and responsibility for mobilization actions throughout the Corps. Such assignments must be a part of the advance

planning so that there will be no misunderstanding of responsibilities in time of crisis. Each Corps level has its role to play.

(1) OCE Headquarters. OCE Headquarters has a responsibility to facilitate the planning efforts and the execution of plans, if necessary, at subordinate levels, particularly at the lead districts. While OCE is responsible for providing the guidance to subordinate levels, it must also ensure adequate resource allocation and the removal of any roadblocks to advance mobilization planning.

(2) Divisions. Divisions have the responsibility for ensuring that districts within their organizations are prepared to meet potential mobilization requirements. Approved concepts for rendering mobilization support must be reflected in plans. Communication links must be established during peacetime to facilitate coordination during a crisis. Support affiliations for mobilization advance planning and execution must be fully explored to provide the best possible local support. Clear authorities must be established that allow and encourage direct coordination among districts both internal and external to the division.

(3) Districts. The district should be the key planning element and the primary implementer of mobilization actions. However, those districts with a major MC orientation (for planning, design, and construction) would constitute the lead districts for all mobilization activities within their existing MC boundaries. Districts with a primary CW orientation, regardless of the division in which they are located, would provide support to the lead districts. It is envisioned that CW districts would generally provide this support within their areas by fielding response teams to meet mobilization requirements. These district offices would provide all necessary support to

effect both advance planning and execution activities. Planning for this type of action and support would have to be fully developed for expeditious implementation in a mobilization situation.

(4) Other elements. Other Corps elements such as laboratories, centers, and agencies will have their own roles in a mobilization. In general, these will be roles providing technical support for the CONUS construction mission in the form of quick-reaction team efforts or short-term research and development (R&D) or studies to solve site-specific problems. Lead districts should plan to tap these services during crisis situations. Also, direct installation support by such agencies as FESA may be an early-on heavy requirement. In addition, laboratories and centers will be called on to address other tasks in support of military OCONUS activities. All military engineering (ME) subjects are possible areas of involvement (e.g., mobility, countermobility, pavements, expedient surfaces, dust control, targeting, engineer intelligence, field fortifications, bridging, mines, sensors, structures, explosives, military hydrology, water supply, mapping). It is envisioned that ME support tasks would also be in the form of quick-reaction efforts such as short-term R&D or studies to recommend solutions for specific problems or applications. Corps elements with these ME capabilities should be aware of these general mobilization requirements, and efforts should be made to maintain a level of competence to satisfy possible needs.

16. Summary. Because of its decentralized mode of operation across the nation, the Corps is uniquely qualified to provide necessary support to its many customers in a mobilization situation. However, to do this will require careful advance planning by all Corps elements. This planning will require the prioritized scheduling of the effort and in-depth analysis of requirements

and capabilities by the Corps elements involved. A basic concept in any such planning must be the provision of "one-stop" service to customers so that requirements can be met expeditiously without any diffusion of effort.

Another key element in planning is that plans, when developed, should not be viewed as static documents to be looked at only when a crisis occurs. Rather, plans must be kept viable through periodic exercise and evaluation, and key personnel must be aware of their mobilization roles and trained to move into such functions with no lost motion. Each Corps element will have its own role to play in mobilization with lead districts established to assume the major responsibilities. Supporting efforts by other elements should be clearly understood and reflected in the mobilization plans.

V. SUMMARY

17. Overview. This is the second monograph in a series of three on Corps mobilization. It sets forth the characteristics of the various types of mobilizations in terms of Corps capabilities and requirements along with some basic planning concepts to guide planners. The Corps must bring its considerable resources to bear on mobilization problems within hours after mobilization is declared. The Corps' personnel resources are substantial, but so are the mobilization requirements. While the requirements for a full mobilization can generally be quantified and assessed as to location, Corps elements responsible for meeting those requirements must analyze the problem in detail, determine the workloads, and allocate the trained resources. The requirements for Corps support in total mobilization (conventional or nuclear) cannot be so clearly defined or quantified, but planning to meet such requirements must be undertaken even at a lower priority. All Corps elements must develop the mobilization plans that accurately reflect internal and external Corps relationships and how requirements are to be met. The resources for developing mobilization plans must be allocated, dedicated, and scheduled to ensure such plan development. And, once developed, such plans must be kept current through periodic exercise and evaluation.

LAST PAGE OF MAIN PAPER

ANNEX A

HISTORICAL REVIEW OF CORPS CONSTRUCTION SUPPORT TO THE MILITARY

ANNEX A

HISTORICAL REVIEW OF CORPS CONSTRUCTION SUPPORT TO THE MILITARY

<u>Section</u>		<u>Page</u>
I	INTRODUCTION	
	Purpose	A-2
	Scope	A-2
	Background	A-2
II	WORLD WAR I	
	CONUS Corps Activities	A-4
	Engineer Troops	A-4
III	THE INTERWAR YEARS	
	MC in the 1920's	A-6
	The Construction Service: 1933-1941	A-6
	The Corps: World War I to World War II	A-7
IV	WORLD WAR II	
	CONUS Construction	A-9
	Engineer Troop Activities	A-9
V	THE KOREAN CONFLICT	
	The Conflict's Impact	A-12
	Theater Engineer Activities	A-12
VI	THE VIETNAM CONFLICT	
	CONUS Corps Support	A-15
	Vietnam Engineer Actions	A-15
VII	OVERVIEW	
	Essentiality of Engineers to Mobilization and Conflict	A-18

I. INTRODUCTION

1. Purpose. This annex provides a review of the Corps of Engineers' increasing involvement in MC to support military and national mobilization during the period including World War I through the Vietnam conflict. During that period, the Corps' ability to respond to a national need during times of stress established the Corps as a primary element on which the country could rely during a national emergency. Some lessons of history in this regard are presented here as indications of how the Corps should view the future.

2. Scope. In examining Corps activities from World War I through the Vietnam conflict, there are some very distinctive periods that need to be addressed. First, there was World War I itself which had some major impacts on the Corps and engineer troops. Second, the years between the two world wars proved to be a significant transition period for MC support. World War II brought the Corps its largest role in MC support. The conflicts in Korea and Vietnam had their own distinctive impacts on the Corps. From all of these periods a series of lessons can be learned, not only for the Corps, but also for engineer troops in the field forces.

3. Background. Corps involvement in support of the military's CONUS base structure is considered essential, particularly in a mobilization situation. The level of Corps effort required depends, in large part, on the level of mobilization declared. Also, many of the specific tasks the Corps would have to undertake in a mobilization will depend on the level of mobilization. General estimates of both effort and tasks can be made from current mobilization plans and an assessment of the military's CONUS support base. However, valuable insights to the Corps' role in mobilization can be gained from past Corps experience in mobilization. Such insights should include the

evolution of the Corps' mobilization role. Aside from the Corps there is the role of engineer troops that are assigned to military field commanders. Although the engineer troops are not part of the Corps, there are some inter-relationships. For example, military engineer officers invariably have one or more tours of duty with CW, and the experience they gain has proved to be valuable in wartime when the officers have troop assignments in a theater of operations. Similarly, military experience in the field has valuable carry-over into the CW assignments, being particularly important to mobilization planning. Accordingly, it is appropriate that there be a historical review in this mobilization study so that past experience can serve as an aid to mobilization planners. Although brief, this review highlights the Corps' past involvement in mobilization efforts and illustrates the magnitude of the Corps' effort.

II. WORLD WAR I

4. CONUS Corps Activities. In May 1917, there was a decision to mobilize the US for war. The Army's initial construction mission was to locate, design, and construct 32 cantonments to house 1.1 million men and their equipment. The effort was to be completed in 16 weeks at an estimated cost of \$90 million. The hastily contrived construction doctrine was simple: build a team, throw away peacetime yardsticks, substitute the day for the dollar, and get the job done. By July 1917, 160,000 workers were under contract. At the height of the effort in 1918, defense construction reached \$1.8 billion and one-half million workers were under contract. Competition among services and within services for contractors and materials drove prices up. Cost-plus-a-fixed-fee contracts replaced competitive bidding. Construction management transitioned from peace to war in a learn-as-you-go fashion. The work got done, but following the war there were recriminations and Congressional investigations. In the final analysis, almost all the lessons taught by that war were forgotten. Afterall, that was the "war to end all wars." Lessons that should have been remembered included:

- a. Total mobilization of a modern mechanized Army requires a huge construction investment.
- b. Mobilization of the construction industry for defense requires a large, existing construction management structure.
- c. Management procedures must accommodate wartime conditions and must be substantially worked out in advance of the conflict.

5. Engineer Troops. During the war years, engineer troops were earning a reputation in the primary theater of operations--Europe. The engineer troops were assigned to the American Expeditionary Force (AEF) and came under

OCE, AEF. Engineer troop activities during the war covered a wide variety of functions such as searchlight operations, camouflage work, mapping, and construction. In the latter category were port berths, storage facilities of all types, railroads, and troop barracks. The extent of troop activity can be seen by noting that by January 1919 engineer troops had put in 885 miles of railroad track and constructed barracks capable of housing 742,000 men.

III. THE INTERWAR YEARS

6. MC in the 1920's. To consolidate MC responsibility, the Construction Service of the Quartermaster (QM) Corps was formed in July 1920. The Construction Service consisted of Construction, Maintenance and Utilities, and Real Estate Divisions. This organization had responsibility for all MC except fortifications which were the responsibility of Army troop engineers. Drastically reduced military spending during the early 1920's restricted the Construction Service to its maintenance functions and left it very short of qualified engineer officers. Young officers avoided QM Construction Service assignments because of the limited opportunities to apply engineering skills. There was increased construction activity as a result of a 10-year program approved by Congress in 1926 to construct permanent posts and major airfields. However, the shortage of experienced officers limited progress.

7. The Construction Service: 1933-1941. With the beginning of Federal efforts in 1933 to offset the Great Depression, Federal programs and funding focused on a variety of national construction programs. At this time the Construction Service had the greatest reservoir of construction knowledge immediately available to the Federal Government. Consequently, the Construction Service became the agency assigned to construct 1,400 Civilian Conservation Corps camps and participate in many Works Project Administration and Public Works Administration projects. Unprepared for the magnitude of this sudden workload, the QM was forced to recall Reserve officers, enlarge the overall QM staff, and hire civilian engineers. As the national economy showed signs of recovery, budgetary concerns became increasingly important and public works construction began to decline. However, international tensions began to rise and in 1938 the Construction Service was given \$65 million for MC--for

hospitals, depots, and Air Corps stations. On 8 September 1939 a limited national emergency was declared, the Regular Army was expanded, and the National Guard activated. The Construction Service was forced to begin a major construction effort to build temporary shelters for incoming military personnel. In May 1940, a further increase in the military forces was launched and the Construction Service expanded construction of military bases. The use of contractors and volunteer qualified Reserves enabled the Construction Service to overcome its shortages of skilled personnel, and complete housing construction programs for an Army of well over 1 million men by June 1941. The Construction Service relied on contractors and outside specialists for the key operations of the Army's physical plant. Responsibility for expanding munitions production facilities also fell to the Construction Service. Initially this expansion was based on an expected force of 2 million men, but after June 1940 the expected force size was raised to 4 million men, and new plants were required. Of particular concern was the shortage of steel needed for construction of munitions plants. The Army had to request a significant increase in its priority for steel from the Supply Priorities and Allocation Board to obtain necessary quantities for rapid munition plant expansion. This and other actions enabled the expansion to take place at a pace commensurate with plans. Foreseeing even greater expansion of the troop base, in December 1940 the Construction Service began developing standardized designs for troop installation construction. In January 1941 the standardization of plans was extended to munitions plants.

8. The Corps: World War I to World War II. Between the wars, the Corps focused efforts on its CW programs--waterway development, flood control, dam construction, harbors, etc. However, the emphasis on CW programs declined as

MC increased in the late 1930's and early 1940's. The Corps, composed of 12 divisions and 50 districts at the time, possessed the decentralized structure necessary to respond to the needs of military area commanders. Yet, overall Corps capability was rapidly declining with the reduction of CW funds. In November 1940, the Corps received the Army Air Corps construction program as a transferred function from the Construction Service. This move was made to bolster the Corps organizational funding and viability and reduce the QM Construction Service workload. However, the Air Corps construction projects nearly overwhelmed the Corps which lacked the engineering expertise to handle this new type of construction nationwide. The Corps overcame the major problems in airfield construction by using expedient measures such as recruiting experienced engineers from civilian life, developing intensive training programs for training engineers in airfield and facility construction, and selecting and managing sound contractors. Of major assistance to the Corps was its broad geographical base and the ability of divisions and districts to relate to local environmental conditions and to apply its knowledge of local construction conditions and assets. During this period, a heated political battle was being waged both within the Army and in Congress as to whether the Corps or QM should have overall responsibility for MC in CONUS. Finally, after many years of controversy on this issue, the President signed the "Madigan Bill" on 1 December 1941. This bill transferred all QM MC and maintenance responsibility to the Corps. This transfer of functions was facilitated by merging the Construction Service capability into the Corps. Consolidation of the two construction organizations provided a decentralized organization and a single body of talent having both MC expertise and large-scale construction management experience.

IV. WORLD WAR II

9. CONUS Construction. On 7 December 1941 the US became involved in World War II. Preparations were still being made for the transition of MC and maintenance functions from QM to the Corps. With war and total mobilization now facts of life, a smooth transition from peace to war without interrupting the continuity of operations was paramount. To preserve operational continuity, no projects were transferred from the QM until Corps divisions and districts were ready to receive them. The Chief of Engineers ensured that his staff was composed of Corps and QM Construction Service personnel and there remained a philosophy of decentralization. Division engineers were given greater authorities, and districts were provided spending authority to execute contracts and responsibility to design new projects. District engineers could approve contracts up to \$5 million and area engineers had approval authority up to \$3 million. Districts also were given direct responsibility for O&M of utilities, real estate, and overall contract management. The Corps and its contractors completed a staggering amount of construction during 1942 in CONUS--482 Air Corps facilities, 389 ground force facilities, 164 storage and shipping facilities, 149 industrial facilities, and hundreds of other types of installations. Although CONUS military construction continued during the remainder of the war, it was at a lesser pace--the major military construction having reached its peak in 1942. The in-place value of Corps construction in CONUS was \$18.3 billion during 1942 to 1945.

10. Engineer Troop Activities. Major engineer troop construction and activities both in rear areas and in direct support of combat forces took place in all theaters during the war. However, probably the most extensive effort was in the European Theater of Operations (ETO) during 1942 to 1945.

A summary of this activity in the United Kingdom (UK) and on the European continent after D-day provides a scope of engineer wartime activity.

a. The UK. The UK's existing base structure was completely inadequate to support the influx of men and equipment when the buildup of US forces began. The Chief Engineer, ETO was responsible for developing the necessary base structure, except for signal communication facilities. Following the successful pattern that had evolved in CONUS, the Chief Engineer, while exercising control of the overall program, decentralized the engineering, design, and construction functions to a major degree and made individual base sections responsible for accomplishing those functions. Base section engineers worked closely with various subdivisions of the British Command in site selection and planning. Construction projects included troop housing, hospitals, various depots, special installations, utilities, and airfields and their facilities. To the extent that it was available, British civilian labor was used on construction projects, but such labor was generally in short supply. A serious problem on all construction projects arose from the fact that US engineer troops had insufficient unit training and units were deficient in experienced construction personnel. Unfortunately, men with previous civilian construction experience generally were not assigned to construction units. This often resulted in limited unit capability and construction deadlines not being met.

b. The European continent. With the invasion of the continent on D-day, engineer troops moved in to provide direct support to the combat forces. As with engineer construction in the UK, the Chief Engineer, ETO had overall responsibility for construction support. However, organic divisional engineer units responded to the needs of field and area commanders. The priority programs for nondivisional engineers were in maintaining the logistics

and transport facilities to ensure an uninterrupted flow of men and materiel to combat units. As a first step in this process, the engineers had the job of port restoration. Plans for port reconstruction had been prepared well in advance of the invasion, and some materials had been stockpiled in the UK. Still materials were short and, in the case of Cherbourg, many supplies for reconstruction had to be acquired locally. Following close behind ports in terms of engineer priority were reconstruction/rehabilitation or construction of inland waterways, railways, railway bridges, roads, petroleum storage and distribution facilities, and airfields. Troop housing was, to a large extent, taken care of by housing troops in existing structures on the continent. This enabled engineer effort to be concentrated in other areas, at least initially. However, once logistics facility construction got fairly well along, engineer effort could be diverted to building or refurbishing troop quarters and building hospitals, a variety of depots and shops, refrigeration facilities, and utilities. Overall, engineer troop support to the combat units proved to be timely and adequate, and many of the deficiencies in engineer units noted earlier were overcome as the troops gained experience and functioned as integrated units.

V. THE KOREAN CONFLICT

11. The Conflict's Impact. The sudden outbreak of hostilities in Korea on 25 June 1950 caught the US with an Army significantly reduced from what it had been during World War II. From a high of over 6.8 million men in 1945 (excluding Air Corps), Army strength had been reduced to slightly over 0.5 million men in 5 years. The President ordered a full mobilization of the military that activated all Reserve components and set in motion the Selective Service System to induct sufficient personnel for fillers and replacements. Within 6 months of the outbreak of hostilities, the strength of the Army had increased to 1.1 million and reached a peak in mid-1952 of about 1.6 million. Fortunately, only 5 years had elapsed since World War II so that the huge CONUS base structure developed during World War II was still more or less intact. This obviated the necessity of a Corps crash construction effort in CONUS as had occurred in the early 1940's. There was a need for some base rehabilitation and an increase in FE O&M, but the Corps still had many experienced personnel from World War II to handle these functions. Thus, the war's primary impact was on engineer forces in the field rather than on the Corps in CONUS. Nevertheless, total defense construction averaged nearly \$3 billion annually during the period.

12. Theater Engineer Activities. Within the Far East Command, engineer troop activities were essentially divided between Korea and Japan. In Korea, the Chief Engineer, Eighth US Army, Korea was responsible for all MC except for airfields. The latter effort was under the direction of the USAF but done by Army engineer forces specifically assigned to that function. In Japan, the engineer functions--primarily in support of Korea-based forces--were the responsibility of the Chief Engineer, Eighth US Army (Rear)/Army Forces Far

East. The activities of these two elements differed considerably and should be considered separately.

a. Japan-based engineers. During the conflict, Japan became the immediate rear base for the forces in Korea, much as the UK had been for the European continent during World War II. Initially, in Korea, US forces faced a major shortage of engineer equipment for construction and other operations. World War II equipment scattered around various Pacific Ocean islands was rapidly assembled and shipped to Japan. However, much of the equipment was in a poor state of repair and required rebuild or extensive maintenance. To accomplish this, the Yokohama Engineer Depot was established and became the major equipment rebuild and maintenance facility for Korea. Much of the actual work was done by local labor under contract to the Army or as direct hires. Later, considerable major maintenance and even equipment procurement were accomplished through Japanese contractors and manufacturers. In addition to direct support of the Korea-based forces, the engineers in Japan were responsible for maintaining the US base structure in Japan and, in some cases, for major construction projects to enlarge or enhance bases. Again, much of this work was accomplished through local direct-hire labor or contracts with a rapidly expanding Japanese construction industry.

b. Korea-based engineers. The engineer requirements in Korea were far more demanding than they had been in Europe in World War II. In Korea, there was no established road system and the North Koreans heavily damaged the limited rail system in the initial phases of the conflict. Thus, the engineer troops were forced to essentially start from scratch in developing a transport network that would support the military. This was particularly important when the counteroffensive began from the Pusan area and after the Inchon landing.

In addition to building a road network and rehabilitating the railway system, the engineer troops were responsible for building troop housing--much of it using prefabricated kits built in Japan--hospitals, depots, and storage facilities of all types. Also, harbor and port maintenance and construction were engineer responsibilities. An initial handicap for engineer troops was a severe shortage of trained equipment operators. This, and the high frequency of equipment repair occasioned by the environmental conditions, necessitated developing intensive training courses in the field and providing a considerable amount of on-the-job training at unit level. As the war progressed, these limitations were overcome, and an adequate base structure and engineer troop force were developed in Korea to support US and other United Nations forces during both combat and the subsequent truce period.

VI. THE VIETNAM CONFLICT

13. CONUS Corps Support. When the decision was made early in 1965 to deploy US forces to the Republic of Vietnam (RVN), the plan was for a gradual deployment. Few Reserve elements were actually activated and the training base was expanded gradually to supply replacements and fillers as units were deployed slowly over a relatively long period. The result of this gradual deployment policy was that the Corps had no major surge requirements for base construction/expansion. Active military posts were generally able to accommodate the influx of trainees with little dislocation. FE workloads increased at some posts, but not so significantly that support was required from other engineer organizations. As in the case of Korea, the primary engineer workload fell to the engineer forces in the theater of operations.

14. Vietnam Engineer Actions.

a. Command structure. When US ground troops were initially deployed to the RVN in March 1965, the engineers could not make firm plans for engineer support, since no strategic or tactical operational concepts were agreed on nor did anyone know how many maneuver battalions were to be deployed. However, the Army command in the RVN developed plans setting construction priorities: airfields, railroads, roads, port facilities, and logistics bases. In September 1965, the main body of the 18th Engineer Brigade arrived in the RVN. All Army construction projects were then assigned to this organization. The brigade was given responsibility for operational planning and supervision of all construction and all nondivisional Army engineer units were placed under the command and operational control of the brigade. The brigade's CG also became Army Engineer on the staff of the the US Army, Vietnam, thus eliminating separate staffs and providing a single point for plans and operations. In

December 1966, the US Army Engineer Command was formed and the CG, 18th Engineer Brigade, became the commander. Engineer manpower resources were then expanded with the arrival of the 20th Engineer Brigade. In April 1968, to centralize control over huge Army construction, facilities, and engineering costs, the US Army Engineer Construction Agency, Vietnam, was created to manage and coordinate military and contractor construction. This agency analyzed contractor operations and management and provided recommendations to reduce cost, provided design and construction management, and provided quality control and equipment use assistance.

b. Engineer construction and operations. The amount of construction required in Vietnam was similar to that in Korea, since, as in Korea, US forces had moved into an undeveloped area that lacked the facilities to support a modern combat force. Almost everything needed as a base structure for US forces, from troop housing to hospitals, had to be built. Additionally, a logistics network had to be built. This included roads, airfields, and ports. In the latter category, the development of a new deep water port at Cam Ranh Bay was a major accomplishment. Much of the work involving ports required keeping access channels and harbors open by dredging. In large part, this was done by Corps civilian dredge personnel either through management of commercial plants or operation of government plants. Throughout this period significant engineer accomplishments were also made in the construction field. Again, the engineers had to rely primarily on contractors for the actual work. With no indigenous construction capability of the type and scope needed, the work was contracted out to a consortium of US contractors who had the equipment and proven capability to do the jobs in the needed time. Overall management of projects was under engineer troop control. However, the experience engineer

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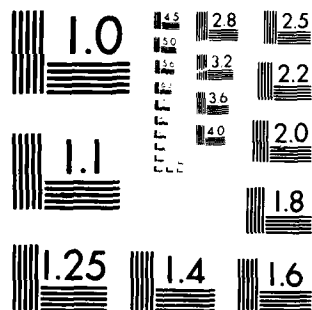
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officers had gained in CONUS in CW and MC project management contributed heavily to successful project accomplishment. The engineer troops also provided direct support to combat activities in areas such as land and mine clearing operations. This work was done under the direct control of the field forces to ensure that it satisfied combat force priorities. The Vietnam conflict and the engineer effort it demanded further demonstrated the ability of engineers to move quickly into an undeveloped area and provide the wide-ranging support needed by field forces.

VII. OVERVIEW

15. Essentiality of Engineers to Mobilization and Conflict. From World War I through the Vietnam conflict, engineers have established themselves in support of the military and nation in mobilization and on the battlefield. The Corps structure in CONUS has demonstrated its capability to deal with the discontinuity that mobilization causes in the peacetime functions and to refocus its CW efforts in time of war on MC of sometimes monumental proportions. In the past, this transition of effort has taken time, but it has been done. (It is doubtful that a future mobilization would afford as much time.) In the theaters of operations, engineer troops have distinguished themselves in their support of the combat forces, and many of the skills learned by engineer officers in CW assignments have proved transferrable to the combat environment. Thus, the engineer ability and demonstrated accomplishments are essential to a modern Army's effective field performance and to building the CONUS base structure. History provides some specific lessons within this context.

a. Engineer field forces. The experience of engineer troops in the field in support of combat elements in four wars have demonstrated that:

(1) Engineer officers who gain experience in CW assignments in the Corps' CONUS structure are an invaluable asset to field operations. The skills learned in operating in a decentralized organization are directly transferable to diverse field commands and operations.

(2) There is no substitute for trained engineer troops who can perform all engineer construction tasks at the unit level. Lack of such trained forces initially hampered engineer operations in World War II and in

Korea. In future mobilizations there may not be the luxury of time to train such individuals and units.

(3) The experience engineer officers gained in Corps construction management is invaluable in a theater of operations. This was important in World War II in the UK and the Korean conflict (particularly in the Japan rear area), and was essential in Vietnam. In future mobilizations and wars, it is likely that the optimum management of construction resources will depend to a large degree on the expertise of engineer officers in this area.

b. Corps. Within the Corps CONUS structure the impact of four conflicts has been significant. It is essential that some of the key lessons learned in these cases not be forgotten. These include:

(1) The construction requirements for a mobilization situation are of such magnitude as to absorb a sizable portion of the country's construction capability. This requires a single engineer management agency to effectively cope with the situation. Diffusion of responsibility between organizations--as between the QM Construction Service and the Corps--is not feasible, particularly when there is a very brief response time.

(2) The decentralized mode of Corps operations in peacetime can be beneficial in a mobilization response because of the disparity of conditions throughout the nation. However, such a decentralized operational mode is only effective if each element is fully prepared to react to mobilization when required.

(3) The magnitude of mobilization construction and other support requirements is such as to absorb the Corps' full peacetime capabilities. Consequently, the Corps must be prepared to transfer the maximum capability to mobilization functions immediately on a declaration of mobilization and to

increase its capability quickly to handle far more construction management than in any peacetime period.

(4) Previous mobilizations have been such that the Corps has had time to make a fairly orderly transition from peace to war. However, over time, technology and international conditions have reduced available response time. In the future, the Corps must be prepared to move from peace to war in a matter of hours.

LAST PAGE OF ANNEX A

ANNEX B

CORPS PERSONNEL AND FUNCTIONS

ANNEX B

CORPS PERSONNEL AND FUNCTIONS

<u>Paragraph</u>		<u>Page</u>
1	Purpose	B-1
2	Scope	B-1
3	Personnel and Functions	B-2
4	Summary	B-6
<u>Figure</u>		
B-1	Corps Peacetime Personnel Strengths	B-3

1. Purpose. This annex provides an across-the-board look at the major Corps elements in terms of peacetime personnel. It includes a functional breakdown of personnel for Corps divisions and districts in CONUS. This functional breakdown is aggregated from a more detailed breakout contained in the Corps Stratification report.^{1/} Corps planners should draw from this generalized functional breakout, in conjunction with the Corps Stratification report, estimates of personnel, by function, that may be transferred to mobilization duties.

2. Scope. Focus of this annex is on the Corps personnel base which constitutes the primary Corps resource for mobilization tasks. There is no effort here to give a complete analysis of that personnel base. Rather, the basic data are presented to provide a sense of functional types and distribution for Corps planners.

^{1/} DA, OCE, Pers Ofc, Corps Stratification.

3. Personnel and Functions. Figure B-1 shows the personnel strengths for the Corps' major elements, including a functional breakout for the Corps' CONUS divisions and districts. These personnel assets are the resources the Corps must rely on for the initial tasks in any mobilization. The figures constitute a base for planning purposes although the strength totals will vary from time-to-time and from source-to-source from what is shown in the figure because of normal personnel actions, workload variations, and personnel accounting methods. In using these data for planning purposes, Corps planners should be aware of several factors.

a. Civilian personnel assigned to the MED(F) may be available for assignment to CONUS mobilization functions around M+30. They should not be counted on in the initial phases of mobilization because of the time required to evacuate them to CONUS.

b. Some civilian personnel assigned to the EUD may be available for assignment to CONUS mobilization functions around M+30. Although these civilians will be offered a chance to stay in noncombat jobs during mobilization, an indeterminate number probably will opt for evacuation to CONUS.

c. Within the functional breakout of personnel in Corps CONUS divisions and districts, a certain portion will have to be assigned to mobilization tasks and be fully diverted from peacetime functions. The number of people so diverted will vary according to function and specific division and district. Corps planners at these levels should make a determination, in conjunction with division and district engineers, of the number of personnel available. In making such determinations, a general guide as to across-the-board Corps functions is presented in the Main Paper of this monograph. This guide shows that up to 90 percent of the people in some functions should be

CORPS PEACETIME PERSONNEL STRENGTHS^{a/}

Organization	Mil	Civilian											Total	
		Headquarters					Field							
		Planes & Engr	RE	Op	Fin, Admin	Sup	Misc	Total	Engr & Const	Op	RE	Spt		Total
OCX HQ ^{b/}	89	--	--	--	--	--	--	1,017	--	--	--	--	--	1,106
Division/District ^{c/}	d/	--	--	--	--	--	--	541	--	--	--	--	--	541
LAVD	5	77	7	16	155	1	13	269	7	--	--	--	7	281
Memphis	3	217	32	172	242	24	67	754	216	696	8	144	1,064	1,821
New Orleans	8	510	49	155	481	38	129	1,362	216	696	8	144	1,064	2,434
St. Louis	4	309	23	39	223	18	30	642	116	467	--	26	609	1,255
Vicksburg	8	293	53	23	291	35	62	757	182	1,062	2	147	1,393	2,158
Total LAVD	28	1,406	134	435	1,392	116	301	3,784	737	2,921	18	461	4,137	7,949
MED(R)	4	180	--	35	103	23	57	398	--	--	--	--	--	402
MED(P)	81	--	--	--	--	--	786	786	--	--	--	--	--	867
Total MED	85	180	--	35	103	23	843	1,184	--	--	--	--	--	1,269
MRD	5	94	6	9	92	2	118	321	6	1	--	16	23	349
Kansas City	9	305	54	54	326	30	26	798	197	242	22	52	513	1,320
Omaha	15	452	54	54	467	26	29	1,100	215	367	31	119	732	1,847
Total MRD	29	851	117	117	885	58	173	2,219	418	610	53	187	1,268	3,516
NAD	4	63	12	12	106	2	39	228	5	--	--	--	5	237
Baltimore	14	323	54	42	380	20	46	865	296	325	13	94	728	1,607
New York	12	202	63	63	233	22	32	588	120	72	--	18	210	810
Norfolk	4	126	21	16	184	12	20	379	117	112	7	19	255	638
Philadelphia	6	131	39	39	150	10	33	371	68	357	--	13	438	815
Total NAD	40	845	189	189	1,053	66	170	2,431	606	866	20	144	1,676	4,107
MCD	3	67	7	7	140	1	64	315	2	--	--	--	2	320
Buffalo	5	132	46	46	99	12	33	322	54	191	--	22	267	594
Chicago	5	116	24	24	116	13	25	292	80	260	--	36	376	673
Detroit	4	152	59	59	220	17	39	487	134	344	--	54	532	1,023
Rock Island	5	139	22	22	139	10	21	329	45	301	--	13	359	693
St. Paul	5	253	36	36	200	11	91	591	63	542	--	53	658	1,254
Total MCD	27	857	194	194	912	64	273	2,336	378	1,638	--	178	2,194	4,557

(Figure B-1 Continued on Next Page)

CORPS PEACETIME PERSONNEL STRENGTHS--Continued

Organization	Mil	Headquarters										Field				Total
		Planes & Engr		Fin.						Engr & Const	Field					
		Op	RE	Adm	Sup	Misc	Total	Op	RE		Spt					
NEED	6	245	49	15	239	14	69	631	56	148	--	--	16	220	857	
NPD	5	257	13	7	195	7	19	498	3	--	--	--	--	3	506	
Alaska	23	119	27	10	149	9	17	331	59	14	--	--	8	435	1,588	
Portland	9	253	106	23	290	21	33	726	182	582	--	--	89	853	1,016	
Seattle	9	242	47	32	238	18	43	640	123	236	4	--	49	412	760	
Walla Walla	5	167	30	8	146	18	43	412	42	261	--	--	40	343	4,350	
Total NPD	51	1,038	223	80	1,038	73	155	2,607	409	1,093	4	--	186	1,692	300	
ORD	3	70	10	6	187	4	15	292	5	--	--	--	--	5	1,310	
Huntington	10	250	60	35	175	25	45	590	110	512	25	--	63	710	1,074	
Louisville	6	223	43	32	167	11	59	535	122	365	9	--	37	533	1,306	
Nashville	7	205	63	21	143	17	44	93	142	633	7	--	24	806	1,237	
Pittsburgh	5	156	33	--	136	7	19	351	18	812	--	--	51	881	5,227	
Total ORD	31	904	209	94	808	64	182	2,261	397	2,322	41	--	175	2,935	314	
SAD	9	90	15	5	131	3	54	298	7	--	--	--	--	7	197	
Charleston	5	66	21	--	51	4	9	151	21	18	--	--	2	41	1,147	
Jacksonville	9	179	50	12	215	10	61	527	164	320	4	--	123	611	2,829	
Mobile	13	455	54	55	477	34	131	1,206	604	774	27	--	205	1,610	1,275	
Savannah	10	281	33	34	363	13	55	779	198	146	56	--	86	486	519	
Wilmington	4	114	23	--	95	6	43	281	44	165	--	--	25	234	6,281	
Total SAD	50	1,185	196	106	1,332	70	353	3,242	1,038	1,423	87	--	441	2,989	223	
SPD	7	83	5	5	104	1	13	211	5	--	--	--	--	5	728	
Los Angeles	11	248	27	19	200	11	34	539	91	48	5	--	34	178	1,096	
Sacramento	13	369	39	35	255	17	15	730	162	170	1	--	20	353	2,547	
San Francisco	11	118	47	--	156	15	21	357	75	49	--	--	8	132	311	
Total SPD	42	818	118	59	715	44	83	1,837	333	267	6	--	62	668	302	
SWD	18	118	11	8	135	4	12	288	5	--	--	--	--	5	1,443	
Albuquerque	4	100	22	13	86	3	7	233	29	31	--	--	5	65	591	
Fort Worth	13	356	38	48	317	7	38	804	303	229	9	--	85	626	967	
Galveston	3	127	29	14	140	7	12	329	110	120	--	--	29	259	1,396	
Little Rock	3	110	50	21	150	9	22	362	73	465	--	--	64	602	5,010	
Tulsa	3	353	51	46	228	4	16	698	112	503	1	--	79	695	1,396	
Total SWD	44	1,164	201	150	1,058	34	107	2,714	632	1,348	10	--	262	2,252	3,010	

(Figure B-1 Continued on Next Page)

CORPS PEACETIME PERSONNEL STRENGTHS--Continued

Organization	Mil	Headquarters				Civilian				Field			
		Plns & Engr	Op	MS	Admin	Sup	Misc	Total	Const	Op	MS	Sgt	Total
RMD	6	--	--	--	--	--	--	338	--	--	--	--	--
Total Divisions/ Districts	439	9,493	1,966	917	9,535	626	2,709	26,125 ^{a/}	5,004	12,636	239	2,112	19,991
Labs													
WES	31	--	--	--	--	--	--	1,335	--	--	--	--	--
CERC	3	--	--	--	--	--	--	131	--	--	--	--	--
CERL	2	--	--	--	--	--	--	218	--	--	--	--	--
CERY	15	--	--	--	--	--	--	298	--	--	--	--	--
ETL ^{b/}	15	--	--	--	--	--	--	284	--	--	--	--	--
Total Labs	66	--	--	--	--	--	--	2,286	--	--	--	--	--
Other ^{c/}													
FEA	156	--	--	--	--	--	--	123	--	--	--	--	--
ESC	6	--	--	--	--	--	--	41	--	--	--	--	--
Total Other	162	--	--	--	--	--	--	164	--	--	--	--	--
Grand Total	736	--	--	--	--	--	--	29,592	--	--	--	--	19,991
													50,340

SOURCE: Except as noted in footnotes, civilian strengths are from DA, OCE, Pers Ofr, Corps Stratification, Mar 79; military strengths are from DA, OCE, Pers Ofr, Military Personnel, Information Roster, 25 Jul 79.

a/ The Corps strength figures used here are considered exceptionally high by the RMO, OCE Headquarters. Potential errors in the Corps Stratification tape, used in this report to obtain a functional breakout of CONUS Corps personnel, and the inclusion of temporary employees in this report probably account for the disparity between RMO figures and those used here. However, for purposes of a mobilization work force, use of the Corps Stratification tape, despite potential errors, is necessary to obtain a functional breakout of personnel. From this functional breakout it is possible to derive percentages of personnel that can be transferred from peacetime to mobilization tasks. Thus, despite discrepancies between various sources on actual numbers of Corps employees, the figures used in this report provide a base and functional profile for planning purposes.

b/ OCE, RQ strength as of 1 Oct 79.

c/ EUD, MED, and RMD division strengths as of 1 Oct 79.

d/ Military strength at EUD not included since these personnel would not be returned to CONUS in event of mobilization.

e/ The breakdown of Headquarters shown on this line entry does not equal the total indicated since breakdowns of EUD and RMD are not provided.

f/ USAFTL strength as of 1 Nov 79.

g/ FESA and ESC strengths as of 15 Oct 79.

Figure B-1

available for mobilization tasks. These people must also have support personnel similarly assigned, in which an estimate of 73 percent appears reasonable. However, this is only a general guide and individual Corps planners will have to determine precise numbers for specific Corps elements. Once those numbers are determined for each element, specific individuals should be assigned to mobilization tasks and trained to undertake such tasks.

d. Personnel within other Corps elements, such as laboratories, centers, and agencies, should be considered available almost exclusively for mobilization support tasks. Such support should be provided to divisions and districts as required and to field forces. Corps planners need to make estimates of the support required from such elements and ensure that those estimates are communicated to the element concerned. These support requirements should be included in appropriate mobilization plans.

4. Summary. The broad Corps personnel capability--in terms of geographic distribution and job skills--provides a unique base for the Corps in meeting mobilization requirements. However, there must be careful advance planning to employ these personnel resources fully and expeditiously in mobilization. This planning should include a determination of the number of people in each major function that can be diverted to mobilization from peacetime activities. Once such decisions are made, then planners need to ensure that specific individuals are named for mobilization and that these individuals acquire the necessary skills to make the transition from peace to war. Corps laboratories, centers, and agencies should be prepared to provide their special skills in a support role to other Corps elements and field forces as required.

LAST PAGE OF ANNEX B

ANNEX C

IMPACT OF CIVIL DEFENSE SUPPORT ON MOBILIZATION PLANNING

ANNEX C

IMPACT OF CIVIL DEFENSE SUPPORT ON MOBILIZATION PLANNING

<u>Section</u>		<u>Page</u>
I	INTRODUCTION	
	Purpose	C-1
	Scope	C-2
	Major Sources	C-2
	Background	C-3
II	EFFECTS	
	Attacks	C-4
	Casualties	C-7
	Damage	C-12
III	RESPONSE	
	Responsibilities	C-15
	Tasks	C-16
IV	SUMMARY	
	Major Points	C-23
<u>Figure</u>		
C-1	Target Pattern for DCPA CRP-2B Attack	C-5
C-2	Effect of Nuclear Weapons on Major Cities	C-10
C-3	Levels of Damage for Selected Infrastructure	
	Categories--New Mexico	C-14
C-4	Partial List of Post-attack Task Types	C-20
APPENDIX C-1--DIRECTIVES FOR POSTATTACK EMPLOYMENT OF CONSTRUCTION RESOURCES STUDY BY THE OFFICE OF CIVIL DEFENSE, CHIEF OF STAFF ARMY, MAY 1969		C-1-1

I. INTRODUCTION

1. Purpose. This annex seeks to establish a nuclear environment framework for Corps planners. The Corps would have to be responsive to the nation's survival needs if there were a nuclear attack on CONUS. Unlike conflicts in the past, a future conflict might make the CONUS base structure, including the civilian population in general, subject to massive enemy attack. It is difficult to calculate the results of such an attack since there are no

experience data from which to extrapolate post-attack conditions. However, some conditions can be established for planning purposes by using hypothetical attacks postulated within pre-set constraints.

2. Scope. This annex includes a discussion of hypothetical nuclear attacks on CONUS and the effects of such attacks on the population and physical infrastructure. Such effects form a base for estimating Corps capability in a post-attack environment and scoping the types of tasks for the Corps to undertake. Specific direction for the Corps in a post-attack situation sometimes is vague, but at other times specific tasks can be discerned in official regulations. To the extent possible, there are details on the types of activities that Corps personnel should plan for in a nuclear environment. Specific planning for the post-attack activities will be the responsibility of division and district planners, generally in concert with local CD elements.

3. Major Sources. Since World War II, government and non-government agencies have done a large number of studies on nuclear attacks on CONUS. There have also been official regulations and directives published to try and focus Federal survival and rebuilding efforts in a nuclear environment. The primary studies and documentation used for this annex are listed in the report bibliography (Annex F) and are recommended as additional reading for users of this report. Those studies sponsored by DCPA^{1/} and the 1979 report done for Congress^{2/} were primary sources for this annex. Additionally, official regulations were relied on as a basis for helping to delineate Corps responsibilities in a nuclear environment. The 1969 and 1973 Army reports cited in the

^{1/} DCPA is one of five agencies combined in 1979 to form FEMA.

^{2/} Congress of the US, Ofc of Technology Assessment, Supt of Docu, The Effects of Nuclear War.

bibliography^{3/} provide substantial detail on Corps responsibilities, tasks, and potential problems in a post-attack environment.

4. Background. A strategic nuclear attack on CONUS is a distinct possibility in an age of advanced technology and great power rivalry. It would be a mistake to avoid planning for such an attack and its consequences despite the predicted horrors of such an attack and a probable equally devastating retaliation by the US. National survival and nation rebuilding mandate that all agencies, including the Corps, plan to use remaining post-attack resources effectively. However, planning for such an event must be broad enough to encompass a wide range of possibilities. Most official planning starts with an assumption that a nuclear attack would occur only after an indeterminate period of increasing international tension or after a conventional mobilization had been declared. However, planners should not rule out the possibility of a nuclear attack with a warning time limited to missile flight time. There are many other uncertainties, besides warning times, involved in establishing a planning base. Would a nuclear attack be limited or unlimited? What does the enemy perceive as the most lucrative targets? Would an attack occur at night or in the daytime? Would an enemy use "clean" or "dirty" weapons? What would be the prevailing weather conditions? Speculation along these lines and on the overall aftermath conditions of an attack could continue ad infinitum. However, in light of all the literature available on a potential nuclear war, such speculation would be unprofitable in a report of this type. Rather, this report focuses on the narrow area of Corps response within its post-attack capability. Such a focus is necessary for Corps planners and should instill confidence that planning is not futile.

3/ DA, OCSA, OCD, Postattack Employment of Construction Resources.
DA, OCE, Postattack Employment of Construction Resources (Planning Assistance to State and Local Governments).

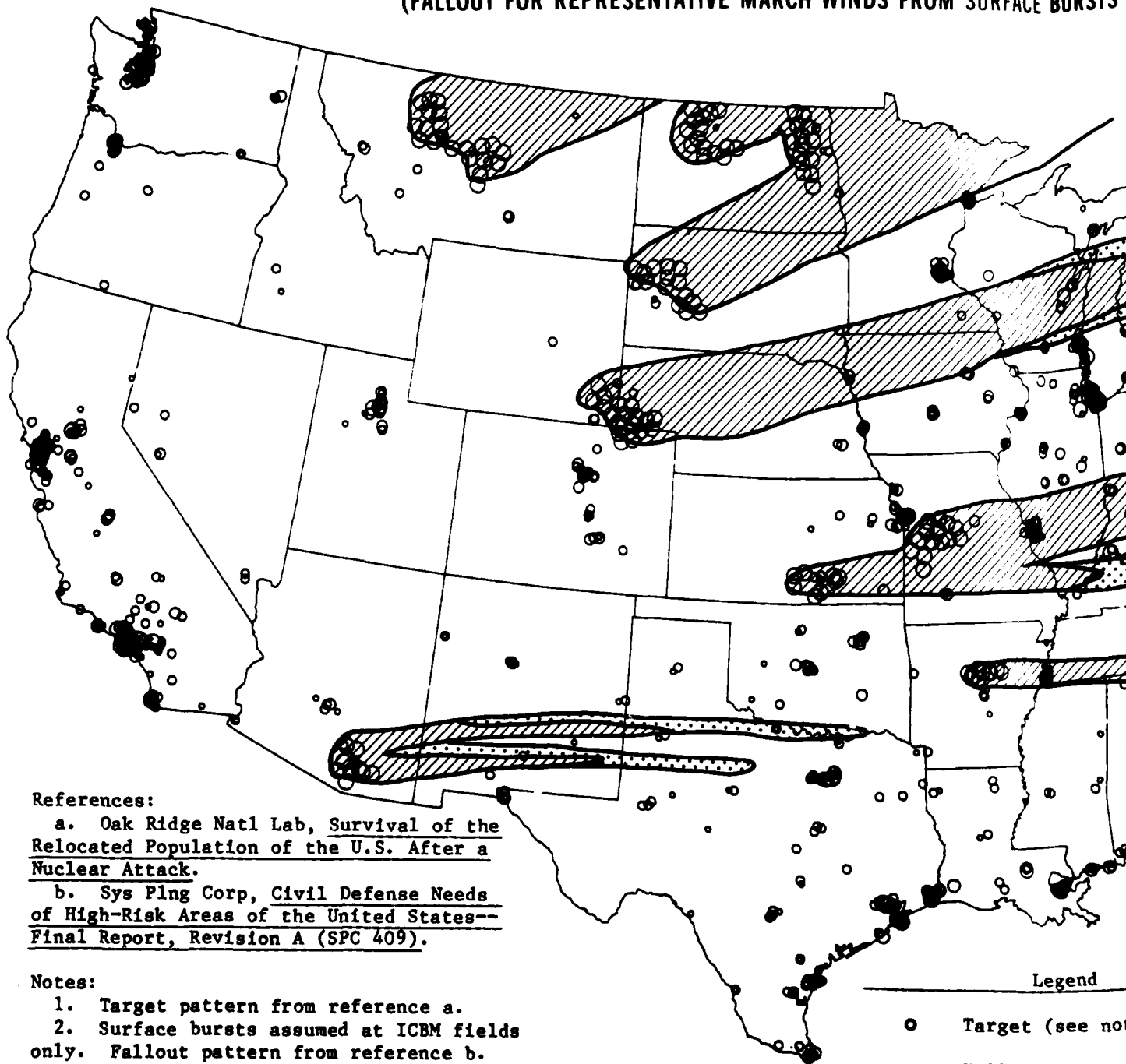
II. EFFECTS

5. Attacks. Despite the uncertainties in postulating an enemy nuclear attack on CONUS, it is necessary for Corps planners to select one or two attacks as a start to creating a base for planning. In selecting an attack(s), target categories usually are grouped by assumed enemy priority into: intercontinental ballistic missile (ICBM) fields, other counterforce targets, other military targets, economic targets, and population centers. The basic attack used in this study targets all five categories. This attack is a specific hypothetical attack prepared by DCPA and others for use as the DCPA planning base. As such, it should be viewed as a planning base by Corps planners who will be working in concert with FEMA officials and others. A second attack also is considered.

a. The extensive attack used here is usually called the "TR-82 attack" and is expected to be within Soviet capabilities in the 1980's. Figure C-1 shows the attack target pattern. This is a massive attack using 1,444 warheads for a total of 6,559 MT of explosive force. The target circles indicate the 2 pounds per square inch (psi) overpressure limit. However, this may vary for some targets, depending on whether air or surface bursts have been chosen for particular effects.

b. The second attack, also developed by DCPA, consists of a set of counterforce targets and significant defense-related research facilities. This attack, not illustrated in this report, was designed as a relative representation of an intermediate level attack. The fallout patterns from this attack are superimposed on the first attack pattern (Figure C-1) to illustrate the effects of surface bursts on counterforce targets. There would be fallout

TARGET PATTERN FOR DCPA CRP-2B ATTACK (FALLOUT FOR REPRESENTATIVE MARCH WINDS FROM SURFACE BURSTS)





References:

- a. Oak Ridge Natl Lab, Survival of the Relocated Population of the U.S. After a Nuclear Attack.
- b. Sys Png Corp, Civil Defense Needs of High-Risk Areas of the United States--Final Report, Revision A (SPC 409).

Notes:

1. Target pattern from reference a.
2. Surface bursts assumed at ICBM fields only. Fallout pattern from reference b.
3. Local fallout from airbursts not shown.
4. CRP attack used here to illustrate possible target locations (almost identical to DCPA TR-82 attack).
5. Circle sizes indicate extent of a specific overpressure for the depicted attack. Refer to DOD, DCPA, High Risk Areas: DCPA Technical Report 82 for precise delineation of affected areas.

Legend

- Target (see notes)
-  Fallout pattern total exposure Roentgens (R)
-  Fallout pattern total exposure and 1,000 R

TARGET PATTERN FOR DCPA CRP-2B ATTACK
RESENTATIVE MARCH WINDS FROM SURFACE BURSTS ON ICBM FIELDS)

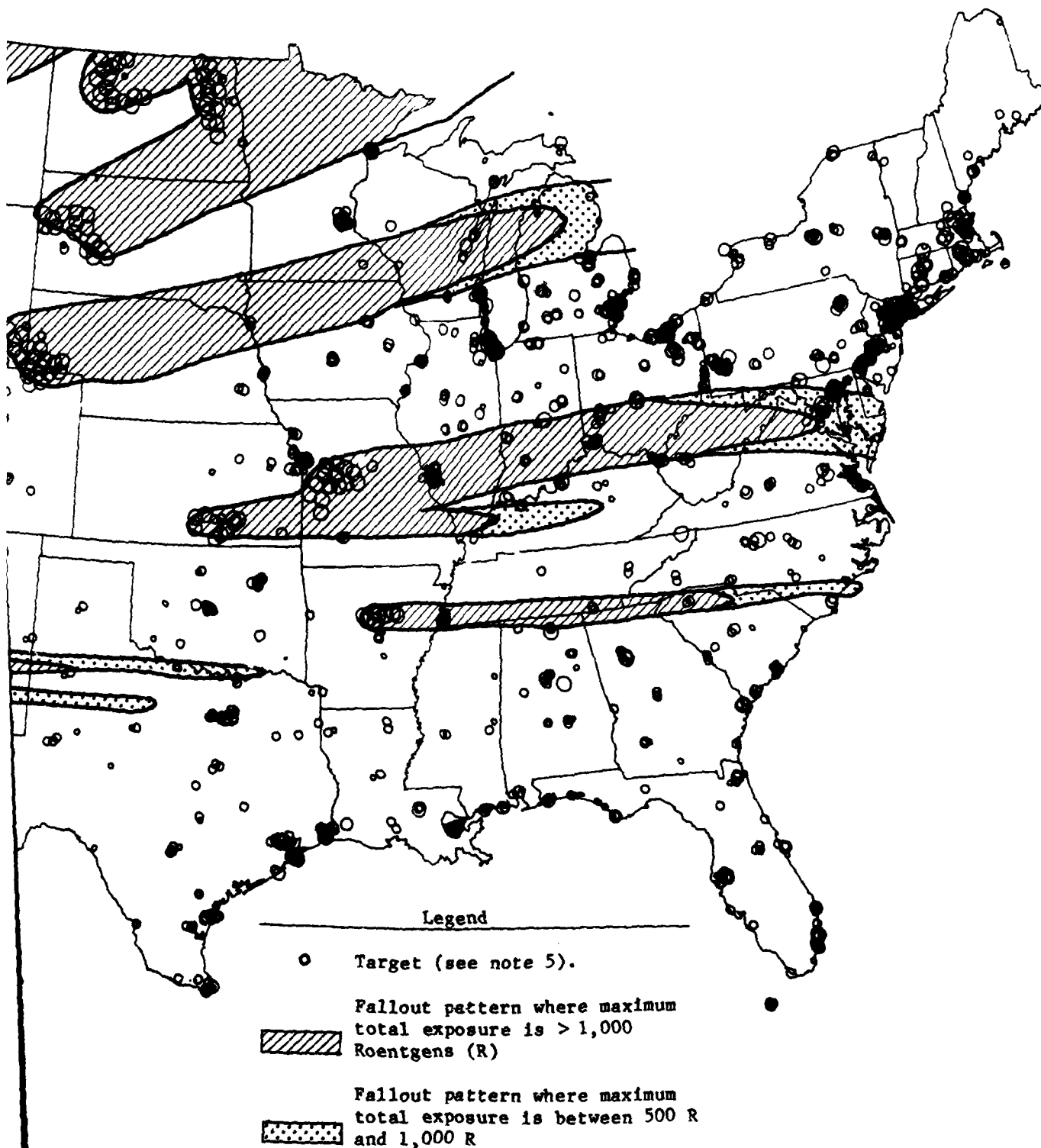


Figure C-1

2

from airbursts, but such fallout would be minimal in intensity and probably limited in area.

6. Casualties. The number of surviving Corps personnel who would be available for post-attack tasks is a key factor for Corps planners in attempting to determine Corps response in a post-attack situation. The total population casualties also are important to estimate, since such an estimate would indicate, to a degree, the types and extent of certain engineer tasks. Estimates of total casualties and Corps survivors or residual work force are highly dependent on all the variations possible in postulating a nuclear attack as well as on the CD posture at the time of the attack. However, despite such uncertainties, a range of estimates can prove valuable as planning parameters. Some of the previously developed casualty/fatality ranges are discussed below.

a. Fatality estimates by three Executive Branch agencies were reported in a range from a high of 155-165 million to a low of 105-131 million people. The variations are dependent on attack assumptions. If the population has time to take advantage of existing shelters near homes, the fatalities could be reduced by up to 50 percent. A study prepared for DCPA^{4/} estimated that a mid-1980's large-scale attack would result in fatalities amounting to 60-80 percent of the US population (122-162 million for the 1970 CONUS population). This last estimate was made assuming no enhancement of the current CD posture. Fatalities in this latter situation could be reduced to 13 percent of the total CONUS population if an effective CRP were operational at the time of the attack. In this latter attack, too, with all primary Corps headquarters in urban areas, about 80 percent of Corps personnel located there

^{4/} Sys Plng Corp, Candidate U.S. Civil Defense Programs.

could be expected to be fatalities. Relative to this, a 1973 Corps study^{5/} on post-attack construction resources states the following:

Corps vulnerability. Additionally, a matter of the greatest concern is the potential vulnerability of the Corps of Engineers current office locations. Should the enemy opt for the destruction of our major cities by missile attack, our field offices and their personnel will be very unlikely to survive in any strength, even with considerable advance warning. Accordingly, the post-attack services of the Corps of Engineers for either military (defense) actions or civil defense support to State and local governments under MSCD (AR 500-70) cannot be guaranteed unless the Corps can arrange to move its offices, in whole or greater part, to safer locations. This same problem will affect NAVFAC, Bureau of Reclamation, and other Federal engineering agencies, as well as major construction contractors.

b. This study developed a detailed assessment of the Corps residual work force by division/district/other element headquarters. An assessment was made using the large-scale attack target pattern shown in Figure C-1 and the estimate of casualties suffered in Detroit from two separate weapons^{6/} The weapons in the Detroit example are 1-MT and 25-MT airbursts at altitudes of 6,000 and 17,500 feet, respectively. These altitudes maximize the 30-psi overpressure area, causing damage to very hard structures near ground-zero. The weapons are not aimed primarily against population targets, and the detonations take place at night without warning. General population casualty rates can be calculated by extrapolating the casualty rates for these Detroit attacks to other urban areas where there are Corps headquarters elements. The process is described below.

(1) The casualties specified for Detroit are in those areas subjected to 1-psi or greater overpressures and include injured. In the

^{5/} DA, OCE, Postattack Employment of Construction Resources (Planning Assistance to State and Local Governments).

^{6/} Congress of the US, Ofc of Technology Assessment, Supt of Docu, The Effects of Nuclear War.

Detroit example, the casualties are 1.1 million for a 1-MT airburst and 3.2 million for a 25-MT airburst. The percentages of the Detroit SMSA are 26 and 76, respectively, for a population of 4.2 million. It is assumed that the attack occurs during nonworking hours and that the distribution of Corps employees in the SMSA is in direct proportion to the general population. Thus, the casualties among Corps employees would be proportional to those of the SMSA population. The casualty rates for the Corps Detroit District Headquarters personnel would be approximately 26.2 percent and 76.2 percent for the 1-MT and 25-MT weapons, respectively.

(2) For most other Corps headquarters areas, population casualty rates can be computed for the same 1-MT airburst if casualties are assumed proportional to population density within the area of the 1-psi or greater overpressures. Based on data provided in the example, the population density for the specific area of overpressures in Detroit was estimated to be 5,462 people per square mile (somewhat greater than the average for the SMSA, which is 2,151 people per square mile). To compute the number of casualties for other cities, ESC used the average SMSA population density based on total area and total population data for the 1970 census. The same computation was made for a 25-MT airburst. The 25-MT weapon, however, was applied only to those cities having a SMSA area of 2,000 square miles or more. For this larger weapon, ESC used the average Detroit SMSA population density rather than that estimated for the 1-MT weapon. Figure C-2 shows percent casualties from a 1-MT airburst in major CONUS urban areas where Corps headquarters are located. Figure C-2 also shows the percent casualties from a 25-MT airburst in the largest populated areas containing Corps headquarters.

EFFECT OF NUCLEAR WEAPONS ON MAJOR CITIES

Location	SMSA Characteristics ^{a/}			Weapon Casualties ^{c/}	
	Area (Sq Mile)	Population		(Percent)	
		Total (Thousand)	Sq Mile Density ^{b/}	1 MT	25 MT ^{d/}
Albuquerque, NM	1,169	316	270	17.1	--
Atlanta, GA	1,727	1,390	804	11.7	--
Baltimore, MD	2,259	2,071	917	8.9	65.9
Boston, MA	987	2,754	2,790	20.4	--
Buffalo, NY	1,591	1,349	847	12.7	--
Champaign, IL	1,000	163	163	20.1	--
Charleston, SC	2,049	304	148	9.9	72.4
Chicago, IL	3,720	6,979	1,876	5.4	40.0
Cincinnati, OH	2,150	1,385	644	9.4	69.2
Dallas, TX	4,564	1,556	340	4.4	32.5
Detroit, MI	1,952	4,200	2,151	26.2	76.2
Fort Worth, TX	1,607	762	474	12.5	--
Galveston, TX	399	169	424	50.0	--
Huntsville, AL	1,348	228	169	15.0	--
Huntington, WV	1,404	254	180	14.2	--
Jacksonville, FL	766	529	690	26.3	--
Kansas City, MO	2,767	1,254	453	7.3	53.7
Little Rock, AR	1,488	323	217	13.6	--
Los Angeles, CA	4,069	7,032	1,728	4.9	36.6
Louisville, KY	908	827	910	22.1	--
Memphis, TN	1,363	770	564	14.8	--
Mobile, AL	2,818	377	133	7.2	52.5
Nashville, TN	1,629	541	332	12.4	--
New Orleans, LA	1,975	1,046	529	10.2	--
New York, NY	2,136	11,529	5,397	9.4	69.6
Norfolk, VA	678	681	1,004	29.7	--
Omaha, NE	1,537	540	351	13.1	--
Philadelphia, PA	3,553	4,818	1,356	5.7	41.9
Pittsburgh, PA	3,049	2,401	787	6.6	48.8
Portland, OR	3,650	1,009	276	5.6	40.7
Rock Island, IL	1,704	363	213	11.8	--
Sacramento, CA	3,436	801	233	5.9	43.3
San Francisco, CA	2,478	3,110	1,255	8.1	60.0
Savannah, GA	445	207	465	45.4	--
Seattle, WA	4,229	1,422	336	4.8	35.2
St. Louis, MO	4,118	2,363	573	4.9	36.1
St. Paul, MN	2,107	1,814	861	9.5	70.6
Tulsa, OK	3,781	477	126	5.2	39.3
Washington, DC	2,352	2,861	1,216	8.6	63.2
Wilmington, NC	1,041	107	103	19.6	--

a/ Dept of Commerce, Statistical Abstract of the United States: 1972.

b/ As is.

c/ Congress of the US, Ofc of Technology Assessment, Supt of Docu, The Effects of Nuclear War.

d/ As is.

Figure C-2

(3) Although the specific numbers and sizes of the weapons applied to Corps headquarters locations may not constitute a well-designed attack, they were used to develop a broad approximation of overall Corps casualties. Figure 10 of the Main Paper contains these estimates. The estimates listed in Figure 10 simply indicate the possible blast effects on personnel of individual Corps headquarters from either of two specific weapons targeted on one or more facilities within the same environs. The aggregate magnitude of the tonnage (520 MT) used on the targets' urban areas listed in Figure C-2 appears to be within a reasonable range of magnitude. The weapons effects listed in Figure C-2, therefore, were used as one basis for approximating total Corps casualties. This and other estimates are described in the subparagraphs below.

(a) The approximation of the Corps residual work force shown in the Main Paper was derived from the casualty rates shown in Figure C-2. In developing that Corps residual work force, it was assumed that all Corps field personnel live in locations sufficiently remote from the targeted facilities to be unaffected by the blasts. Thus, the residual Corps work force is approximately 80 percent of the total CONUS peacetime work force. Figure C-2 does not include two Corps locations which are not considered to be potential targets and a third, Walla Walla, Washington, because of its small area size. If Walla Walla were added to the list in Figure C-2, the change in the total Corps survivors would be slightly less than 1 percent even if its entire headquarters of 417 employees were assumed to be casualties.

(b) The approximation of 20 percent casualties derived in the above paragraph is probably low compared to casualties in a large-scale attack such as that shown in Figure C-1. No allowance was made for casualties

from fallout which is a factor in all cases with counterforce targets regarded as a first priority. Also, the level of attack (520 MT or about 8 percent of the total shown in Figure C-1) on the cities listed in Figure C-1 may be too low for an attack in which all of them are targeted. As can be seen from Figure C-1, much of the total megatonnage is applied to the counterforce targets. Also targeted are many of the larger cities of the West Coast and some in the southwest, northcentral, and northeastern parts of the nation.

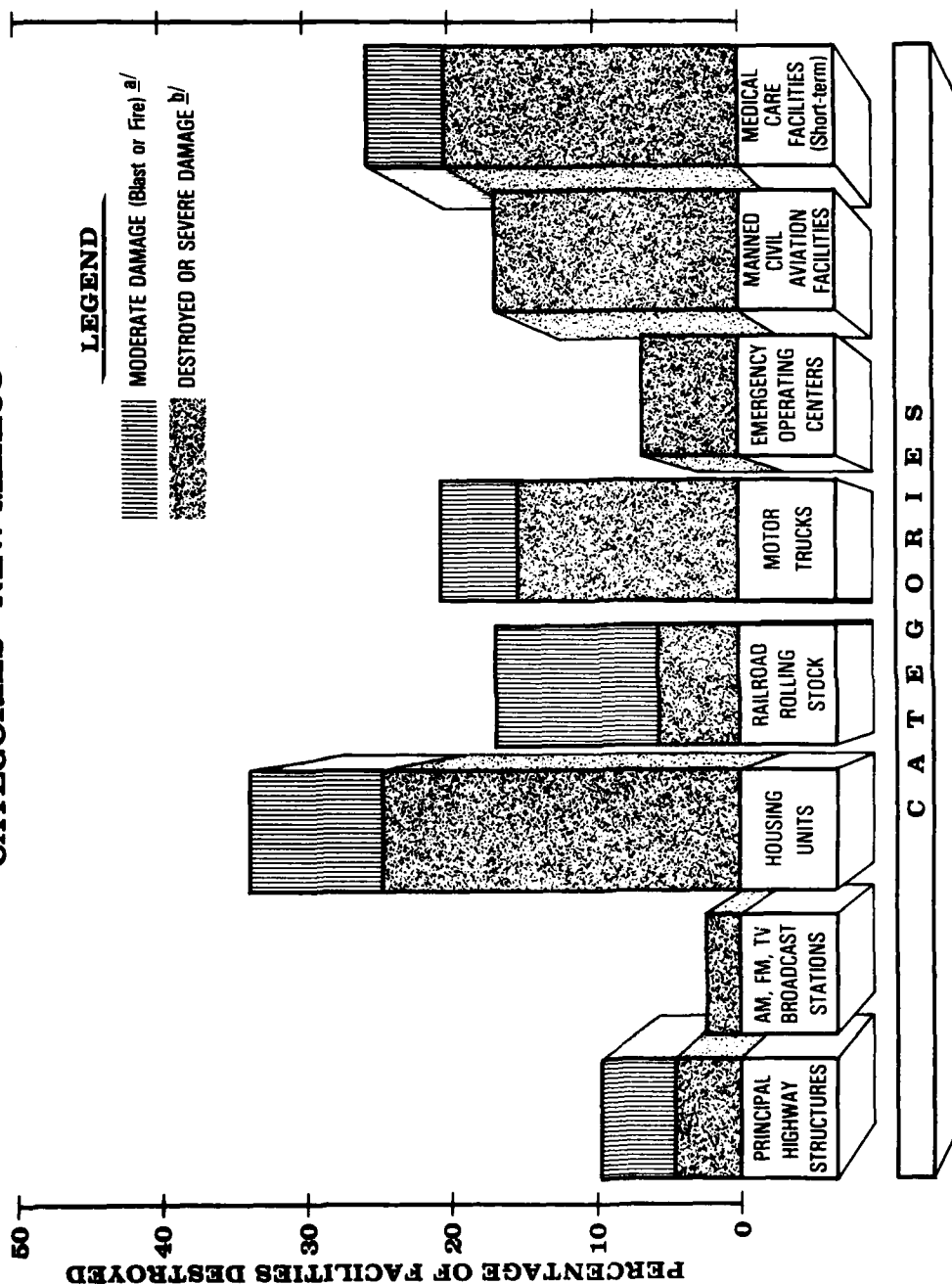
(c) Planners can develop a gross estimate of possible Corps casualties on the higher side of the scale using the ranges cited in paragraph 6a, above. A range of 60-80 percent fatalities for the total CONUS population occurring primarily in urban areas can be applied to Corps headquarters personnel. With an 80 percent fatality rate among headquarters personnel and no casualties to field personnel assumed, overall Corps survivors would be about 60 percent of the CONUS work force. The Corps residual work force would still amount to about 50 percent of the peacetime force even assuming a 20 percent casualty rate among Corps field personnel from fallout or other causes.

7. Damage. There can be considerable engineering effort required to restore damaged facilities after a nuclear attack. Yet, it is essential for survival. In one study of potential damage, the damage sustained from five detonations at three locations in New Mexico was estimated.^{7/} Two of the detonations are at Kirtland Air Force Base (Albuquerque), two others at the White Sands Test Center, and the fifth at Los Alamos. All bursts are 1-MT bursts at the optimum height to maximize the 10-psi overpressure radius of effect. The damage categories were selected from a list in the READY data

^{7/} Sys Png Corp, Civil Defense Needs of High-Risk Areas of the United States--Final Report Revision A (SPC 409).

base which was prepared and maintained by the Federal Preparedness Agency (FPA). (The FPA was one of the five agencies recently amalgamated to form the new FEMA.) Figure C-3 shows estimated levels of two degrees of damage in bar graph form. The three targets are highly developed and populated centers in New Mexico. There is substantial damage to housing, transportation modes, and medical care facilities. Civil aviation damage is presumably mainly that at the Albuquerque International Airport which is close to ground zero. There are no engineering skills or equipment needed for many of the urgent tasks involved such as rescue and evacuation, food and water distribution, and the movement of people. Other tasks, however, such as debris removal, decontamination, and boarding windows of buildings require heavy equipment, tools, skilled operators, and organization.

LEVELS OF DAMAGE FOR SELECTED INFRASTRUCTURE CATEGORIES - NEW MEXICO



SOURCE: Sys Plng Corp, Civil Defense Needs of High-Risk Areas of the United States--
Final Report Revision A (SPC 409).

- a/ Usable or easily repaired.
- b/ Useless or requires extensive repair.

Figure C-3

III. RESPONSE

8. Responsibilities. Corps responsibilities in relation to a nuclear attack on CONUS are set forth in certain Army Regulations (ARs), Engineer Regulations (ERs), and the Engineer Continuity of Operations Plan (COOP). These involve CD planning, construction, and support activities in the period preceding a possible attack and post-attack employment of its construction and engineering resources in support of the Army and the nation. The successful execution of the Corps post-attack mission calls for coordination with all parties involved because these available Corps construction and engineering resources are to be allocated to both military and nonmilitary CD support missions. Those involved include Federal, state, and local civilian agencies; military installations dependent on district support; and representatives of the Army and other armed services whose duties include CD support. It is essential to survival and recovery in the post-attack period to have mutual understanding of the other roles by all parties involved in pre-attack planning. It is important to note that the Corps mission in support of CD is part of the Army mission. CD is a civil responsibility; the Army responsibility is to support those CD efforts where they will not detract from its military mission. Military support to CD is a temporary measure and will be terminated as soon as possible (see AR 500-70).^{8/} This regulation further states that "Measures to ensure continuity of operations, troop survival, and the rehabilitation of essential military bases will take precedence over military support of civil defense." It is thus inferred that the Corps mobilization mission is to begin, continue, or be resumed as soon as conditions at the time will

^{8/} DA, HQ, AR 500-70, Emergency Employment of Army Resources--Military Support of Civil Defense. Hereafter referred to as AR 500-70.

permit. A Corps study for DCPA completed in 1973^{9/} states that military support to civil defense (MSCD) should be considered in contemplating the extended use of Corps assistance in CD.

Continued CE Assistance. The use of Corps of Engineers services for execution of postattack civil defense support after the withdrawal of uniformed troops (the end of MSCD) is a grey area. Presumably, if the CONUS Army Commander requested the Corps of Engineers to continue activities in Civil Defense support after the other elements of MSCD are withdrawn, it would be done, at least temporarily, even though this concept is contrary to the primary thrust of AR 500-70. However, it would be far better to clarify this point in advance through specific legislation, Executive Orders, or preattack Agreements between OCD, OEP, and the Corps of Engineers.

9. Tasks. AR 500-70 and ER 500-2-1^{10/} suggest some of the tasks that the Corps might be called on to perform in support of CD. The tasks referred to in this context are those in support of the local civilian communities and states in their post-attack effort for survival and rehabilitation. They involve Corps emergency operations capabilities and its construction and engineering capabilities. These are tasks that might, in the hours, days, or weeks after an attack, be initiated at the district level or, at some later stage, be assigned from the command post or a regional CD director. Radiological monitoring and establishment of communications are two important CD functions that could receive support through the in-house capability of Corps personnel and equipment. Other tasks mentioned in ER 500-2-1 are related more to the Corps construction, engineering, and administrative capabilities such as debris clearance, damage assessment, and emergency construction. AR 500-70

^{9/} DA, OCE, Postattack Employment of Construction Resources (Planning Assistance to State and Local Governments).

^{10/} DA, OCE, ER 500-2-1, Emergency Employment of Army and Other Resources. Hereafter referred to as ER 500-2-1.

lists more specific items which the Army should perform to assist CD. AR 500-70 defines engineering support as including such construction work and technical support as engineering service for carrying out activities with state and local governments and necessary for pre-attack planning and post-attack execution of CD actions. Paragraph 2-4e of AR 500-70, which is quoted below, lists the categories of assistance for inclusion in military plans to assist civil authorities and provides an indication of a few engineer support tasks that would be required in the post-attack period.

Plans developed to assist civil authorities in times of emergency will be in coordination with and be supplementary to the capabilities of State and local governments and other non-military organizations. They will complement and not be a substitute for civil participation in civil defense operations. Military plans will be concerned with the following categories of assistance:

- (1) Restoration of facilities and utilities including transportation, communications, power, fuel, water, and other essential services.
- (2) Emergency clearance of debris and rubbish including explosive ordnance from public areas.
- (3) Fire protection.
- (4) Rescue, evacuation, and emergency medical treatment or hospitalization of casualties and preventive measures to control the incidence and spread of infectious diseases.
- (5) Recovery, identification, registration, and disposition of deceased persons.
- (6) Radiation monitoring and decontamination to include identifying contaminated areas and exchanging information with adjacent jurisdictions.
- (7) Movement control, to include plans and procedures for essential movements.
- (8) Maintenance of law and order.
- (9) Issue of food, essential supplies, and materiel to include collection, safeguarding, and issue of critical items in the initial postattack phase.

(10) Emergency provision of food and facilities for food preparation, should mass or community subsistence support be required.

(11) Damage assessment.

(12) Provision of interim communications using available mobile equipment to provide command and control.

a. Most engineering and construction tasks will have to be done by contract although some limited number of the post-attack tasks, cited above, may be accomplished with in-house Corps personnel and equipment. Many jobs, such as utility restoration, would require the expertise of surviving municipal employees familiar with the equipment and systems on the ground. Corps in-house personnel would do engineering tasks, such as damage assessment, appraisals of structural safety, and estimates of work force requirements. The major efforts requiring equipment, equipment operators, and construction supervisory personnel will require mustering and organizing the nation's surviving construction capabilities even after a limited attack. Surviving engineer units in the armed services would have some capability in early emergency efforts, particularly in special tasks such as construction of floating bridges or ferries. However, survival requirements at Army, Navy, and USAF installations in themselves might readily absorb any of such residual capability. Although the post-attack effort and the planning for it are primarily civilian responsibilities, national survival could make them a prerequisite to the functioning of the armed forces themselves. Military installations and civilian communities function at varying degrees of mutual dependence, particularly in the areas of utilities and transportation networks. In many instances, the two communities are serviced by the same power, water, waste treatment, and telecommunications systems. DOT has suggested that the Corps might include planning support for correction of highway chokepoints, such as

bridges or blocked tunnels, and similar problems as rehabilitation support missions. DOT further suggested that discussions by the two organizations go forward on these matters. The apparent interdependence between many civilian and military requirements probably would increase with increasing attack magnitudes. The types of engineering and construction tasks suggested by the regulations should be expanded for Corps planning purposes--possibly for comparison with the potential availability of capable contractors. Figure C-4 is a brief list of work types requiring contract effort.

b. The extent and exact nature of the survival and rehabilitation tasks in a post-attack emergency would not be known until after an attack occurred. It will be necessary to assess damage and survey the surviving construction resources for accomplishing work. It will also be necessary to assess the locations and the nature, quantities, and condition of construction supplies and the locations, assets, and capabilities of surviving contractors throughout the nation. Inventories of this type should be available in pre-attack planning; the post-attack task should be an assessment of the residual resources. The contractors themselves and their associations should be involved in the planning. To some extent, the Corps routinely maintains such inventories of contractors as part of its peacetime emergency operations responsibilities. Both the Corps CW and MC responsibilities keep it abreast of the capabilities and locations of a wide range of contractors. A key element in the speed and success of post-attack rehabilitation and recovery will be the effective employment of surviving work forces and construction materiel for priority requirements on a nationwide scale.

c. The enormous task of managing these resources, including assignments of priorities for their use, cannot be deferred until the post-attack

PARTIAL LIST OF POST-ATTACK TASK TYPES

Type of Work	Purpose or Nature
1. Decontamination	Remove radioactive fallout from construction and transportation equipment and areas needed for use or access.
2. Burial of Dead	Excavation of common graves for hundreds of thousands or millions of persons killed.
3. Debris and Rubble Clearance	For rescue, access, and transport of people and supplies.
4. Demolition of Damaged Structures	For removal of hazards to rescue teams, construction crews, and other survivors.
5. Temporary (Expedient) Repairs of Buildings to House People or for Other Uses	Protect survivors from weather; for medical care; storage, administration such as personnel processing, and food storage; food distribution.
6. Repair Transportation Routes and Mark Detours	Remove wrecks, make expedient repairs, provide ferry or floating bridge crossings, make roads passable for transport of vital needs to surviving population or evacuation of survivors (vital needs: food, water, medical supplies, blankets, clothing, fuel, construction materials).
7. Utilities Installation and Operations	Water, sewage, electric power, and telephone communications.
8. Erection of Fences and Directional and Warning Signs	To protect survivors or warn them of hazardous areas, and to guide survivors, rescue teams, and other workers, and to discourage looting.
9. Firefighting	Civilian firefighters mainly, but Corps might be involved in inventory of fires and determining which should be contained, allowed to burn out, or fought to extinction with limited resources available (water, equipment, and personnel).

Figure C-4

period, but must be considered in pre-attack planning. The Corps and agencies responsible for CD have been concerned in the past about management of construction resources in a post-attack period. The concern includes a question of the extent to which the Corps might be called on for support (i.e., concern that the Corps could fall heir to a major role in coordinating major construction). Efforts have been made in the past to commit the Corps to a greater role in the post-attack management of construction resources. There is still concern today and a strong sense that the Corps would at least be called on to provide post-attack inventories and the status of construction contractors for the purpose of construction management for rehabilitation and recovery. Resolution of the Corps' role in construction management is needed in current discussions among the Corps, DOD, and FEMA.

d. In the period 1968-73, three Army studies worthy of special attention were prepared with reference to the Corps construction mission in a post-attack nuclear environment and the related requirements for pre-attack planning. The first study^{11/} was conducted under the aegis of the Chief of Staff Army (CSA) by a joint special study group consisting of representatives of both OCE and the Office of Civil Defense (OCD). This study was prepared pursuant to a Secretary of the Army (SA) memorandum,^{12/} dated 30 July 1968 in response to a memorandum for the SA,^{13/} dated 25 June 1968. Appendix C-1 contains copies of these memorandums. OCD functioned under the SA from early 1964 until it was abolished and succeeded in 1972 by DCPA within DOD. The first study was concerned with determining the Department of the Army mission,

^{11/} DA, OCSA, OCD, Postattack Employment of Construction Resources.

^{12/} DA, OCSA, VCSA, Memo for SA, Post Attack Employment of Construction Resources.

^{13/} DA, Ofc of Acting SA, Memo for CSA and Dir of CD, Post Attack Employment of Construction Resources.

if any, in providing assistance to state and local governments in developing, coordinating, and executing their plans for management and deployment of construction resources under post-attack conditions. It also considered any possible additional Army assignments with terms and conditions that should apply. The second study^{14/} was a follow-on study based on one of the recommendations of the first. Prepared by the Corps for DCPA, this study is a report with recommendations based on the results of four pilot projects for pre-attack planning executed by OCE under an agreement originally made with the Director of Civil Defense. These studies contain a wealth of insights to the working relationships and problems in the Corps' role in support of CD. Because of reorganizations and other actions since their publication, some of their detail may be outdated. However, they are valuable in their broader context as basic documents for any future investigations or for background in this area.

^{14/} DA, OCE, Postattack Employment of Construction Resources (Planning Assistance to State and Local Governments).

IV. SUMMARY

10. Major Points. It is quite evident that a strategic nuclear attack on CONUS, occurring prior to or during a state of military emergency, would impact severely on the Corps mobilization mission. Such an attack could take place at any time prior to or during a mobilization. It could occur between a full and a total mobilization for a conventional war.

a. The level or size of a nuclear attack can range in intensity and types of targets, depending on Soviet objectives. No one knows exactly how a nuclear attack on the US might be configured. It could take form on several levels--from an attack on the US counterforce and other targets of major importance in a war to an all-out attack to include most of the civilian population.

b. Estimates of the possible surviving Corps work force can be derived through assumptions based on general population survival estimates published in current studies. Estimates made on this basis indicate that the surviving Corps work force might range from a low of 50 to 60 percent to approximately 80 percent.

c. The Corps mission in MSCD is part of the overall Army mission. Military plans for support of CD are developed to supplement civilian capabilities. Primarily an engineering and management organization, the Corps has limited capabilities for accomplishing tasks directly with in-house personnel. While some survival tasks such as damage assessments and fallout monitoring may be accomplished by in-house Corps personnel, the types of construction tasks for survival and recovery need the capabilities of civilian contractors and the management of those forces.

d. Survival and recovery from a possible nuclear attack require coordination in planning for post-attack construction among both civilian agencies and the military. Planning coordination and the vast effort that would be required in the management of construction resources in a post-attack environment are issues of concern among some members of both the Army and other government agencies.

e. Some people think that if an attack should occur, the Corps would be relied on heavily for related post-attack functions because of its broad and intimate knowledge of construction contractors and demonstrated abilities in peacetime emergencies. Two studies prepared in the late 1960's and early 1970's advocated a larger and more extended role for the Corps in post-attack management of and pre-attack planning for the employment of construction resources.^{15/} Although it may be assumed that these areas are under review by the new FEMA, the Corps depends on the management of construction resources for both its post-attack MSCD and mobilization missions. Therefore, it is incumbent on all Corps planners to acquire familiarity with whatever system of post-attack construction resources allocation and management evolves. The Corps should have a major input for shaping that system.

^{15/} DA, OCSA, OCD, Postattack Employment of Construction Resources.
DA, OCE, Postattack Employment of Construction Resources (Planning Assistance to State and Local Governments).

APPENDIX C-1

DIRECTIVES FOR POSTATTACK EMPLOYMENT OF
CONSTRUCTION RESOURCES STUDY BY THE OFFICE OF CIVIL DEFENSE,
CHIEF OF STAFF ARMY, MAY 1969

This appendix contains copies of the following directives which initiated the study cited above.

	<u>Page</u>
Vice Chief of Staff Army Memorandum for Secretary of the Army, subject, <u>Post Attack Employment of Construction Resources</u> , 25 June 1968	C-1-3
Acting Secretary of the Army Memorandum for Chief of Staff Army and Director of Civil Defense, subject, <u>Post Attack Employment of Construction Resources</u> , 30 July 1968	C-1-5

- COPY -

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF STAFF
WASHINGTON, D.C. 20310

25 June 1968

MEMORANDUM FOR: SECRETARY OF THE ARMY

SUBJECT: Post Attack Employment of Construction Resources

1. For some years the Army has felt that an effective readiness program should be developed which would ensure the prompt application of residual construction resources to tasks most essential to the Nation's survival and recovery following a nuclear attack upon the United States. Following such an attack, the Army will have an urgent need for construction resources in the cleanup and restoration of its own installations (Inclosure 1). In addition, in its civil defense role, the Army is responsible for providing assistance to the states and local governments in rescue and relief operations, including the restoration of essential services. Army studies indicate that after a massive nuclear attack on the continental United States, resources of approximately 320,000 pieces of heavy engineering equipment and three million skilled construction personnel would be needed for recovery operations. These studies also indicate that Army construction resources which are highly responsive to centralized control could furnish only about 0.3 of 1 per cent of the equipment and 2.1 per cent of skilled personnel required to carry out anticipated military and civilian recovery operations. However, surviving civilian construction assets located countrywide would provide a sufficient additional capability to meet this demand, provided they are responsive to coordination and direction.

2. A recent study, "Military Engineering in Support of the U. S. Army 1967-75," examined this subject and recommended cognizance be taken of the fact that in the event of a nuclear attack, the Corps of Engineers (CE) may be confronted with a mission of great magnitude in the field of recovery and restoration. I believe there is a distinct possibility that in the confusion following such an attack, the task of coordinating emergency construction might well fall to the CE. Emergency construction responsibilities in the Federal establishment are now diffused among some 15 Federal departments and agencies under the overall program guidance of the Office of Emergency Planning (OEP). OEP and its predecessor agencies have recognized the desirability of having a single agency responsible for coordination of preparedness measures related to emergency construction, and over the past 11 years there have been sporadic efforts to assign some responsibility to the CE. Initiation

C-1-3

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SUBJECT: Post Attack Employment of Construction Resources

of the latest effort resulted from a unanimous recommendation by the President's Emergency Planning Committee in July 1965 and culminated with circulation by the Bureau of the Budget of a draft Executive Order in January 1966. Objections on the part of interested Federal departments and agencies to the transfer of this responsibility to the Secretary of Defense (SECDEF) caused the Director of OEP to defer further action on this assignment and to create an Interagency Emergency Construction Committee to assist them in carrying out a readiness program (Inclosure 2).

3. Delegation by Executive Order of a broad preattack planning and coordinating mission for emergency construction to the Army and in turn the CE, would be a logical step toward ensuring rapid response and efficient management of surviving civilian construction resources. However, any such mission assignment to the CE depends upon an appropriate OEP delegation to the SECDEF. Because of previous planning by OSD with OEP for use of the CE in this area, it is assumed that the SECDEF would delegate any such mission he might receive to the Secretary of the Army and the CE in turn.

4. Section 1 of Executive Order 10952, as amended, (Inclosure 3), and the Civil Defense Act of 1950 (64 Stat. 1245), from which it derives its statutory authority, indicate in part that the civil defense responsibilities now assigned to the Office of Civil Defense (OCD) include: "Emergency assistance to state and local governments in a post attack period, including water, debris, fire, health, traffic police, and evacuation capability." This mission entails OCD assistance to the states in planning for and management of emergency construction resources during the survival period. It is one for which the CE is uniquely qualified (Inclosure 4). Their use in this area would not only assist in meeting current Army responsibilities, but would provide training and preparation for accomplishing broader operational responsibilities for emergency management of construction resources during the recovery period should they be called upon to do so.

5. I therefore recommend that a study be made jointly by the Army Staff and the Director of Civil Defense to determine the mission that should be assigned to the CE for assisting the states in development, coordination, and execution of their plans for emergency management of construction resources, and the terms under which such a mission should be assigned.

/s/

4 Incls^{1/}
as

RALPH E. HAINES, JR.
General, United States Army
Vice Chief of Staff

1/ Inclosures not available.

C-1-4

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- COPY -

30 Jul 1968

MEMORANDUM FOR CHIEF OF STAFF
DIRECTOR OF CIVIL DEFENSE

SUBJECT: Post Attack Employment of Construction Resources

Reference: Memorandum June 25, 1968 from Vice Chief of
Staff - this subject

Will you please jointly conduct a study regarding the mission, if any, of the Department of the Army to provide assistance to States and localities in developing, coordinating, and executing State and local plans for management of construction resources under postattack conditions.

The study should include a determination of the scope, terms, conditions, and authority for such a mission. It should then consider additional assignments, if any, and the terms and conditions under which such assignments should be made.

Arrangements for participation in the study, as appropriate, by other departments and agencies of the Federal Government, may be made.

(sgd) David E. McGiffert

David E. McGiffert
Acting Secretary of the Army

LAST PAGE OF APPENDIX C-1

C-1-5

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ANNEX D

INSTALLATION-PRODUCTION BASE MOBILIZATION REQUIREMENTS

ANNEX D

INSTALLATION-PRODUCTION BASE MOBILIZATION REQUIREMENTS

<u>Section</u>		<u>Page</u>
I	INTRODUCTION	
	Purpose	D-2
	Scope	D-2
	Background	D-2
II	TROOP INSTALLATIONS	
	Military Population Fluctuations	D-4
	Installation Capacity Analysis	D-5
	Population Curves	D-9
	Summary	D-29
III	PRODUCTION BASE INSTALLATIONS	
	General	D-30
	Identified Requirements	D-31
IV	OVERVIEW	
	Installation Support	D-33

<u>Figure</u>		
D-1	Fort Benning Real Property Asset Capacities- Utilities	D-8
D-2	Projected Army CONUS Troop Strength	D-10
D-3	Category A--Illustration--Camp Shelby	D-11
D-4	Category A Posts	D-12
D-5	Category B--Illustration--Fort Leonard Wood	D-13
D-6	Category B Posts	D-14
D-7	Category C--Illustration--Fort Ord	D-15
D-8	Category C Posts	D-16
D-9	Category D--Illustration--Fort Stewart	D-17
D-10	Category D Posts	D-18
D-11	Category E--Illustration--Fort Lee	D-19
D-12	Category E Posts	D-20
D-13	Category F--Illustration--Fort Bragg	D-21
D-14	Category F Posts	D-22
D-15	Category G--Illustration--Fort Belvoir	D-23
D-16	Category G Posts	D-24
D-17	Identified Production Base Support	D-32

I. INTRODUCTION

1. Purpose. This annex provides a basis for determining Corps requirements associated with expanding, rehabilitating, or upgrading the Army's CONUS installations and production base in a full or total (conventional) mobilization.

2. Scope. During a conventional mobilization, full or total Corps support is required primarily for enhancing troop installations and production base facilities. The rapidity of the Corps' response in expanding or enhancing these facilities determines the military's ability to meet timely manpower and materiel expansion goals. Therefore, to the extent possible, this annex quantifies and scopes the Corps tasks involved in installation mobilization support. Failure of various MACOMs to define their mobilization requirements makes it impossible for the Corps to develop definitive mobilization support plans. There is a major burden on Corps planners to take positive action to solicit the customer requirements data necessary for adequate planning. This annex indicates those areas in which Corps planners should seek data.

3. Background. It is axiomatic, although generally forgotten by planners, that a construction buildup must precede any manpower or production buildup. Mobilization planners envision both a manpower and a production surge once a mobilization is declared. The manpower surge will be particularly severe in terms of system stress within the first 30 days of mobilization when Reserve components report and a large trainee population begins to arrive at training stations. Although plans for stationing both Reserve components and trainees are in a state of flux, it is obvious that some installations will have to receive more personnel than they have facilities to handle. The facility deficiencies translate into Corps mobilization workloads--workloads

that in many cases must be satisfied in the first 15 days of mobilization. Expedient construction and other measures must be planned for well in advance of mobilization, but finite planning is obviously impossible until detailed requirements on an installation-by-installation basis are developed. Still, the scope and type of requirements can be indicated as key guides to Corps planners. Similar surge requirements will be placed on the production base, and DARCOM has indicated heavy requirements for Corps support. Corps mobilization planners must plan to divert significant peacetime resources to mobilization tasks. To determine what those resources will be, Corps planners must seek out many requirements at the MACOM and installation level. The following provides an indication of the requirements needed and some of the data gaps.

II. TROOP INSTALLATIONS

4. Military Population Fluctuations. During a mobilization, the military population at any installation will fluctuate over time as active forces are deployed; Reserve components mobilize and deploy; and trainees report, train, and deploy. The data contained in FORSCOM's Mobilization Troop Basis Stationing Plan combined with TRADOC's Post Mobilization Individual Training Support Plan permit developing installation population profiles for each installation planned for use in mobilization. These profiles illustrate the peaking and troughing of populations through buildups and drawdowns over time. In turn, the profiles can be used to compare, over time, periodic population peaks with installation ability to accommodate personnel loadings. However, in constructing such profiles, some caveats are in order. Significantly, the two basic planning documents cited above have recently gone through major revisions with the new FORSCOM plan not available until February 1980 (the new TRADOC plan was dated October 1979). However, even with the revisions necessitated by sharply increased training loads projected for the first 30 days of mobilization, there will continue to be reappraisals and fluctuations in loading plans as installation surveys, politics, and other considerations come into play. Thus, planned installation populations will have to be continually monitored by Corps planning elements. This study uses the pre-October 1979 planning documents even though they are, at best, only indicators of population loadings. What is needed in addition to population profiles is an adequate measure of installation capacity. However, there is no one installation feature that constitutes such a measure. Therefore a mix of factors must be considered.

5. Installation Capacity Analysis.

a. General. On any installation, a combination of three categories of real property assets determines installation population capacity. These assets must be considered both separately and in combination when determining potential increased population loadings at any installation. The assets include, by category:

(1) Production assets. On a divisional post, the training and range areas demand the largest amount of land. The area requirement for combat unit training grows as doctrine evolves, requiring a ground combat unit to defend on or assault against increasingly larger frontages and involving formations in greater depth. As weapons evolve with greater ranges and greater lethal areas, the range requirement also increases. With the use of aircraft, not only is there a land requirement for airstrips, but there must be control of the airspace above ranges to avoid unwanted aircraft/round confrontations. Thus, the land area available on an installation limits the number, and sometimes the type, of units and individuals that can simultaneously train there. Classrooms are another production asset. Most of them are adaptable to general use, but some training requires a specific type of classroom (special equipment or special security measures). The number of general and specific classrooms available limits the number and type of units and individuals that can simultaneously train in them.

(2) Housing assets. Broadly speaking, the housing assets of a post include the facilities on post which directly support the military population's off-duty living requirements. Thus, not only a place to sleep, but mess facilities, PXs, commissaries, post theaters, field houses, swimming pools, athletic fields, and clubs cluster around the concept of housing

assets. The size of the requirement for housing assets is determined basically by the size of the post military population. However, the correlation is not absolute since there are the questions of off-post housing assets used by military personnel, of dependents living on post, and the use of housing assets by other than post personnel (e.g., retirees). The ongoing ability of an installation to accept personnel loading on its housing assets can be manipulated within a capability envelope by applying certain policies. The living space allocated to each individual can be modified. Buildings designed for housing may be in other uses and can be reclaimed. Buildings not designed for housing can be converted to living space. The use of emergency living space, such as tentage, can be used. The official leasing of off-post housing assets can be used. But, the limit of housing accommodation is reached when there is maximum use of all existing local assets. Further expansion then calls for construction.

(3) Support facility assets. When inhabitants or visitors on a post take a shower, wash equipment, flush toilets, or get a drink of water, they probably take for granted the water system that makes these activities possible and the sewerage system that handles the effluents. But, both water and sewerage systems have finite capabilities, and a post's ultimate population size can be limited by the capabilities of these assets. Electrical production and distribution systems and heating systems similarly limit populations.

b. Capability profiles. Each installation and the CONUS system of installations has a capabilities profile reflecting its capabilities and limitations in accommodating changes in growth. As the size and characteristics of a current or projected population requiring stationing at an installation

or group of installations is established, these characteristics and size can be compared with the installation capabilities profile. If the population requirements exceed the installation capabilities, it is generally possible to expand the installation assets given sufficient time and money. If training areas and ranges are needed, land can be purchased and the necessary roads and other improvements constructed. If the water storage or distribution system or the sewerage treatment system limit post capability, construction of additional assets can be accomplished. The same applies to quarters, classrooms, and hospital wards.

c. Expansion capability profiles. There is an Army evaluation system which compiles information useful in performing installation capabilities profile analyses, both for current capabilities and for logical expansions of installation capabilities. The system is formulated in Department of the Army, Headquarters' AR 210-23, Master Planning for Army Installations--Emergency Expansion Capability, and directs planning analysis for installations having a mobilization mission. To date, a great deal of data has been accumulated, but the system has not yet reached a phase where there are approved, finished plans available. A post emergency expansion capability plan is a logical document to consult for assessing post potential for increased installation use. The following paragraphs illustrate the type of summary analysis possible and desirable when evaluating the mobilization capability of an installation. The summary is constructed from data contained in Muir and Associates' Fort Benning Emergency Expansion Capability Plan.

(1) A major factor apparent in examining Fort Benning's real property assets is that the post has four separate major cantonment areas: the Main Post, Kelly Hill, Harmony Church, and Sand Hill. Figure D-1 shows

that each has a capability profile for supporting populations. Illustratively, a capacity ceiling on population supportable in the Sand Hill area based on the sewerage system cannot realistically be overcome by surplus sewerage capacity elsewhere on post. Effective planning for mobilization expansion has to be cognizant of the existing real situation in great detail.

FORT BENNING REAL PROPERTY ASSET CAPACITIES-UTILITIES
(Populations Supportable by
Post Subcantonment Area)

Cantonment Area	Main Post	Kelly Hill	Harmony Church	Sand Hill
Current Main Occupant	USAIS ^{a/}	192d Infantry Brigade	Training, Storage, and Maintenance (192d Infantry Brigade)	OSUT ^{b/}
<u>Water</u>	Main Plant Capacity: 86,000			
Supply Main	65,550	10,526	55,980	17,224
Booster Pumps	NA	11,961	28,708	NA
Storage	18,432	5,632	12,032	36,864
<u>Sewerage</u>				
Collecting Lines	50,000	30,000	30,000	19,000
Lift Station	53,000	17,780	35,710	12,700
Treatment Plant	No. 2	No. 1	No. 1	No. 1
<u>Electric</u>				
Substation	62,222	7,778	8,333	16,667
Distribution Lines	56,477	44,677	44,677	14,677

^{a/} OSUT--on-site unit training.

^{b/} USAIS--United States Army Infantry School.

Figure D-1

(2) Data like those in Figure D-1 are further displayed in bar graphs that show, over 90 days, how much each element can be expanded to support various population loads. Such data address not only utilities, but also training areas, heating capability, etc. This permits development of an emergency expansion plan which, in the case of Fort Benning, concludes that the installation has an 85,000-person ceiling, achievable within 90 days of the start of an expansion program. A shortcoming of such a capability summary is that it does not provide for expedient measures that would have to be taken within the very first days of mobilization to accommodate the early influx of Reserve components. The so-called "90-day quick-fix" generally is inadequate since early population peaks occur in the first 15-30 days at many installations. Thus, the Corps planners must initially be prepared to institute expedient measures to increase installation capacities.

6. Population Curves. Figure D-2 is a projected CONUS strength curve applicable to full and total mobilization. This curve does not include forces deployed overseas, which obviously account for the dip in the curve beginning after D+2 or 3. The forces represented by the curve would be distributed among CONUS installations, and the curve shows the resident population load on the installations over time. Figures D-3 through D-16 are representative population profiles for mobilization posts. In examining these curves, it becomes apparent that the crucial time period for station loading during a full or total mobilization is within the first 30 days. According to plans, in that time period active deploying units are in the process of vacating CONUS facilities, Reserve components are in the process of occupying CONUS facilities and then vacating them, and the individual training program is expanding its throughput and requiring increasing real property resources on

PROJECTED ARMY CONUS TROOP STRENGTH (Full & Total Mobilization)

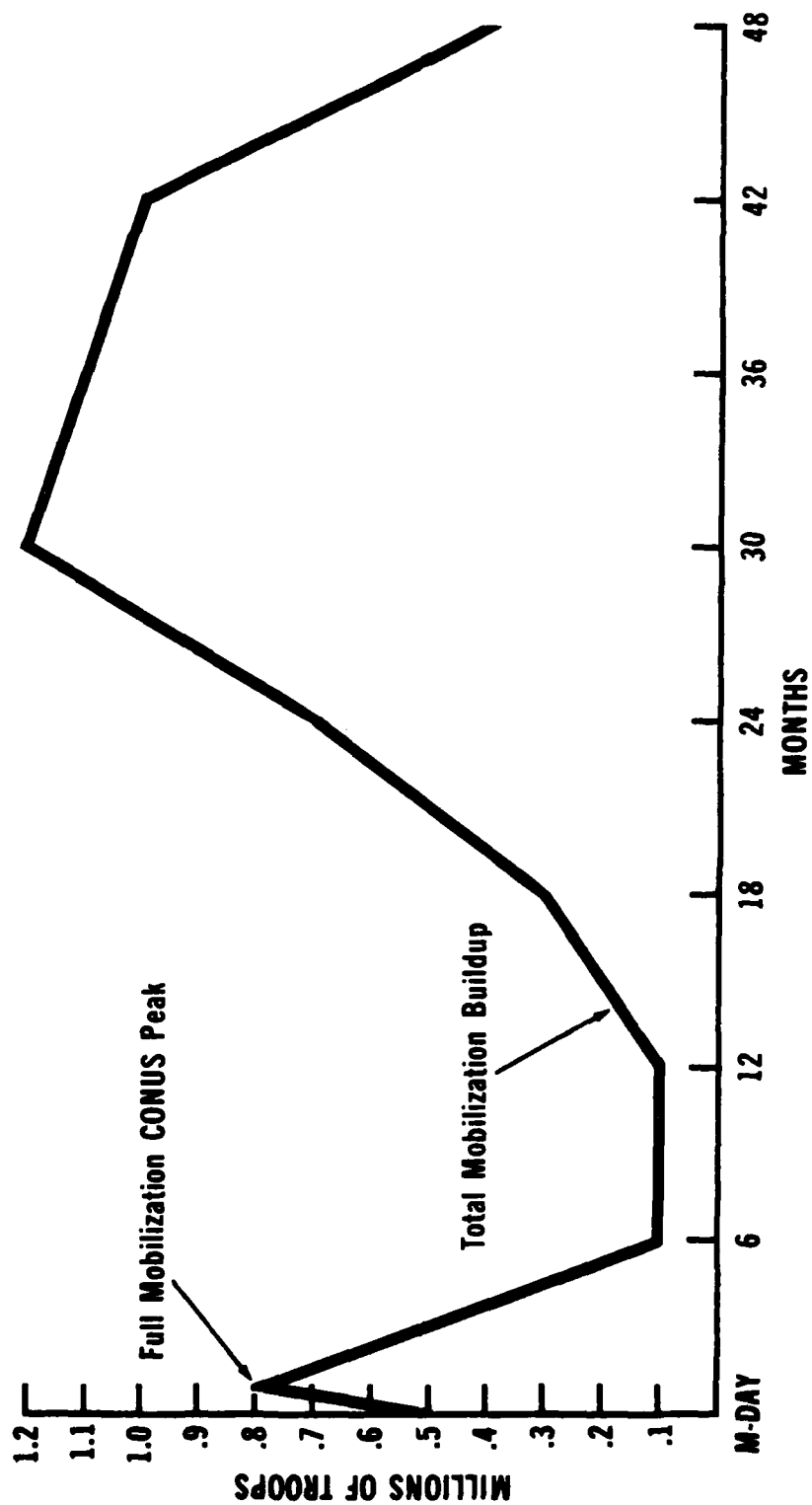


Figure D-2

CATEGORY A -- ILLUSTRATION -- CAMP SHELBY

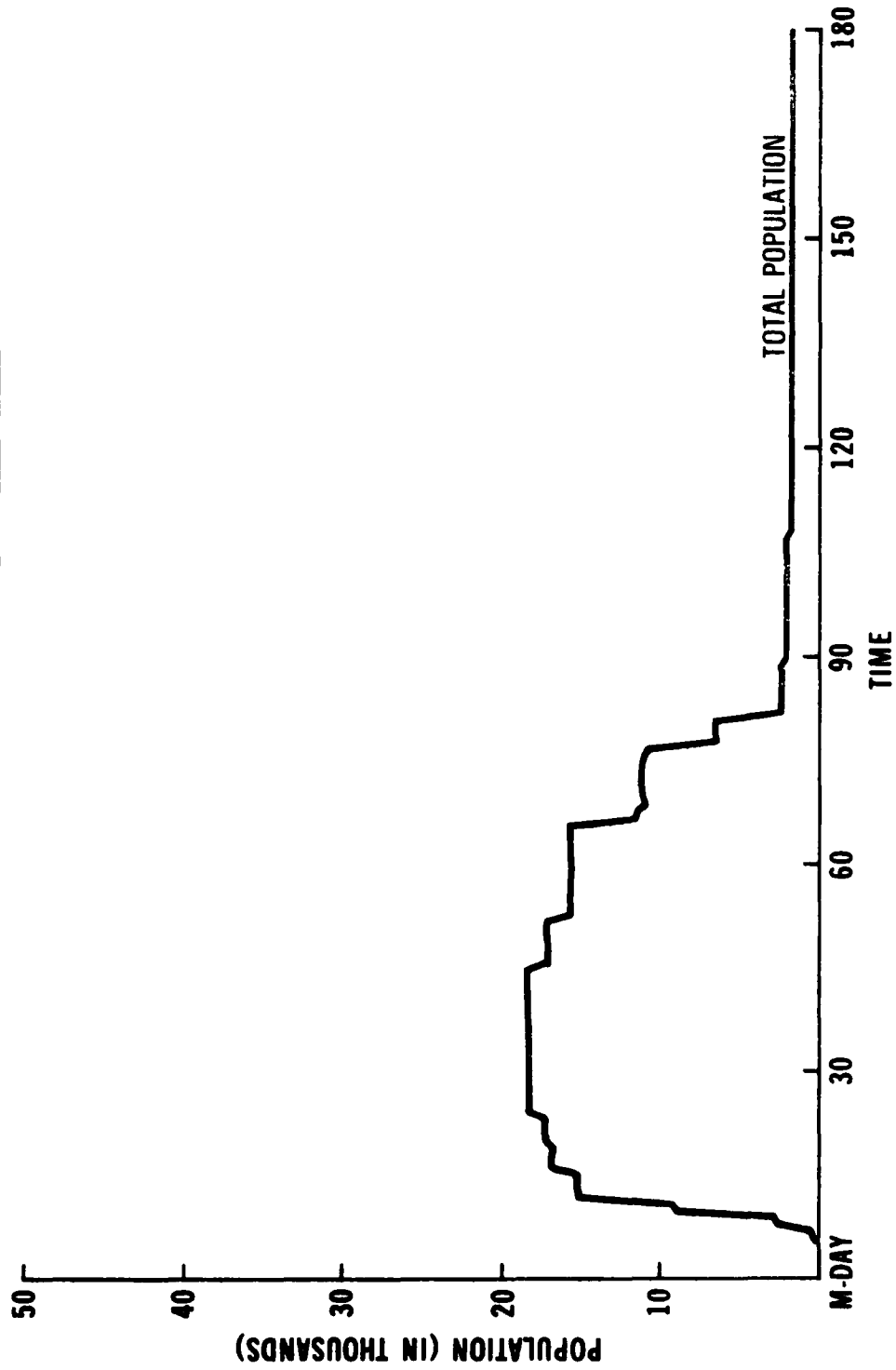


Figure D-3

CATEGORY A POSTS

	ASIP ^{a/} Strength Range	M-day Pop	Peak Pop ^{b/} (Thous)	% Growth	A ^{c/}	B ^{d/}
Camp Shelby	Not Included	0	18	NA	0	0
Camp Grayling	Not Included	0	21	NA	0	0
Ft A. P. Hill	Subpost (Lee)	0	6	NA	0	0
Camp Roberts	Subpost (Ordnance)	0	8	NA	0	0
Ft Drum	20-25	0	26	NA	0	0
Ft Chaffee	15-20	0	17	NA	0	0
Ft Indiantown Gap	15-20	0	22	NA	0	0
Ft McCoy	25-30	0	24	NA	0	0
Ft Pickett	Subpost (Lee)	0	14	NA	0	0
Camp Ripley	Not Included	0	14	NA	0	0
Camp Atterbury	Not Included	0	10	NA	0	0
Camp Edwards	Not Included	0	9	NA	0	0
Ft Irwin	Subpost (Ordnance)	0	12	NA	0	0
Gowen Field	Not Included	0	3	NA	0	0

a/ DA, OCE, Army Stationing and Installation Plan (ASIP): "Each installation has been assigned a master planning long range strength to facilitate planning. Facilities programming will be limited to the total installation strength shown."

b/ Based on the DA, USAFORSCOM, Mobilization Troop Basis Stationing Plan and coordinating the DA, TRADOC, Post Mobilization Individual Training and Support Plan (PMITSP) in effect in the summer of 1979. The PMITSP was revised and republished in October 1979.

c/ Individual trainee population according to the PMITSP in effect before 1 October 1979.

d/ Individual trainee population according to the PMITSP in effect after 1 October 1979.

Figure D-4

CATEGORY B -- ILLUSTRATION -- FORT LEONARD WOOD

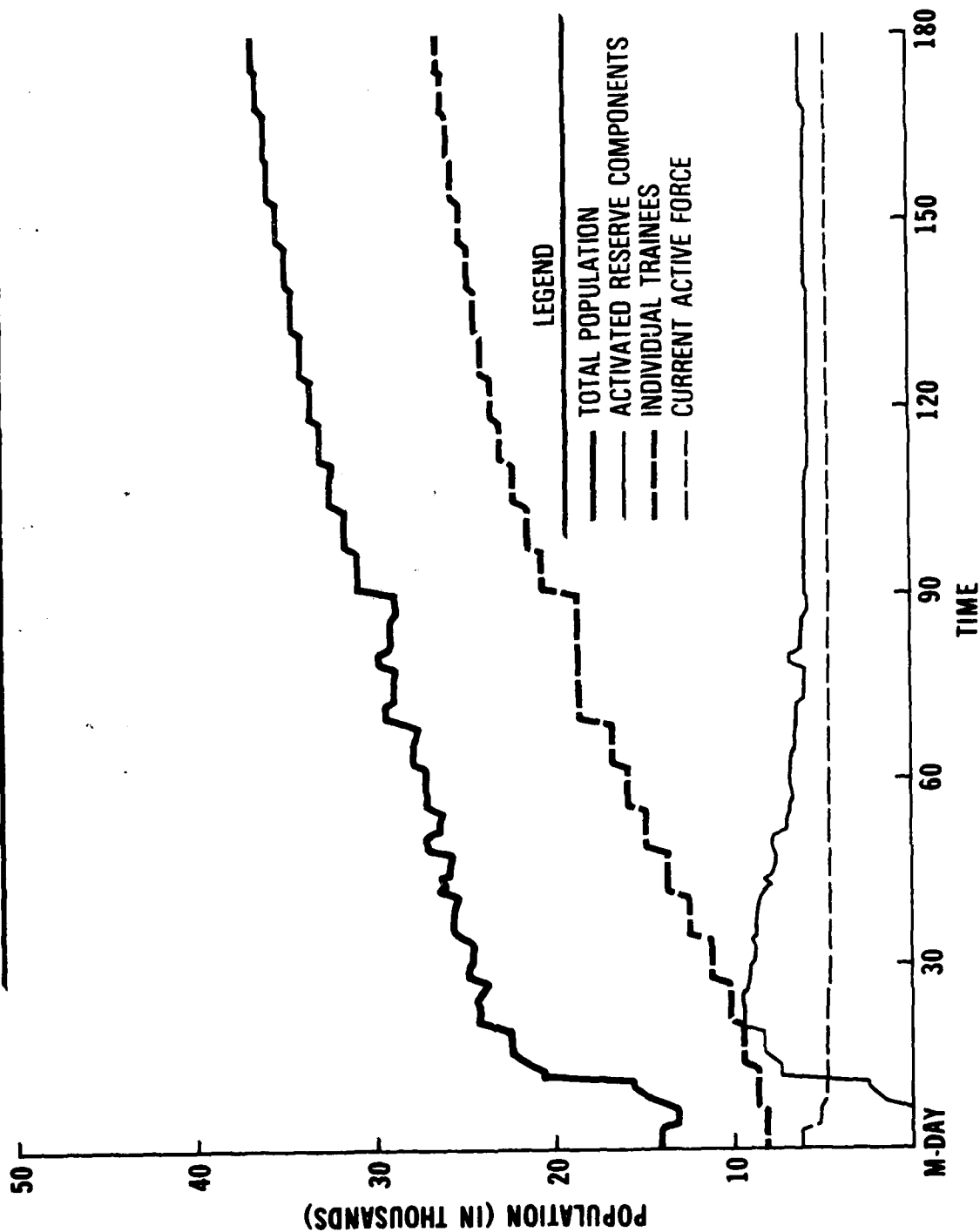


Figure D-5

CATEGORY B POSTS

	ASIP ^{a/} Strength Range	M-day Pop	Peak Pop ^{b/} (Thous)	% Growth	A ^{c/}	B ^{d/}
Ft Leonard Wood	15-20	14	36	158	26	43
Ft Bliss	20-25	15	32	110	21	32+ ^{e/}
Ft Jackson	15-20	13	27	110	18	40
Ft Gordon	15-20	16	35	122	24	16+ ^{e/}

a/ DA, OCE, Army Stationing and Installation Plan: "Each installation has been assigned a master planning long range strength to facilitate planning. Facilities programming will be limited to the total installation strength shown."

b/ Based on the DA, USAFORSCOM, Mobilization Troop Basis Stationing Plan and coordinating the DA, TRADOC, Post Mobilization Individual Training and Support Plan in effect in the summer of 1979. The PMITSP was revised and republished in October 1979.

c/ Individual trainee population according to the PMITSP in effect before 1 October 1979.

d/ Individual trainee population according to the PMITSP in effect after 1 October 1979.

e/ Some data are incomplete and population will exceed figure given.

Figure D-6

CATEGORY C -- ILLUSTRATION -- FORT ORD

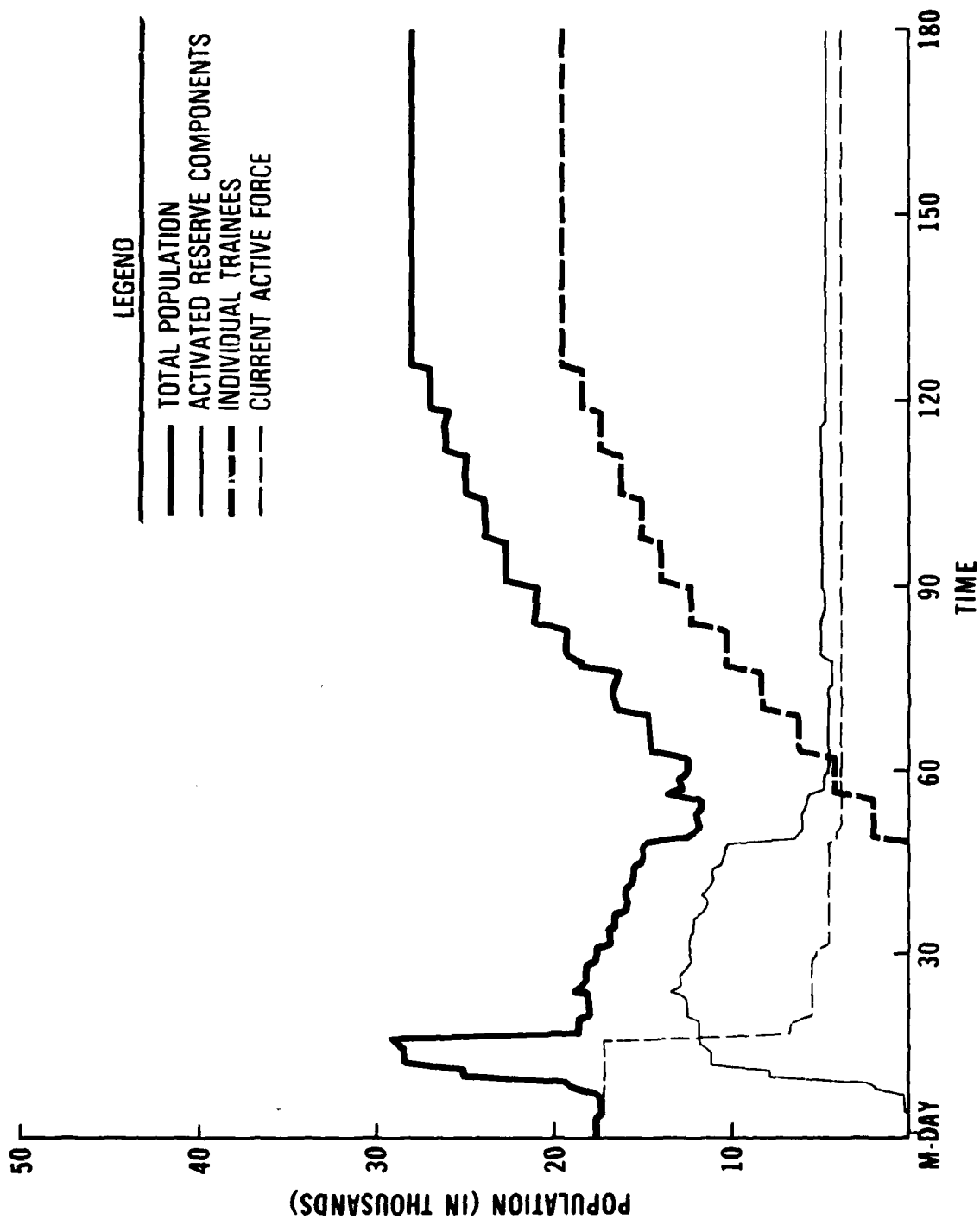


Figure D-7

CATEGORY C POSTS

	ASIP ^a / Strength Range	M-day Pop	Peak Pop ^b / (Thous)	% Growth	A ^c / 	B ^d /
Ft Ord	20-25	18	29	64	20	28
Ft Benning	25-30	16	47	198	31	30
Ft Knox	20-25	19	38	94	31	38 ^e /
Ft Polk	20-25	14	28	102	19	26

a/ DA, OCE, Army Stationing and Installation Plan: "Each installation has been assigned a master planning long range strength to facilitate planning. Facilities programming will be limited to the total installation strength shown."

b/ Based on the DA, USAFORSCOM, Mobilization Troop Basis Stationing Plan and coordinating the DA, TRADOC, Post Mobilization Individual Training and Support Plan in effect in the summer of 1979. The PMITSP was revised and republished in October 1979.

c/ Individual trainee population according to the PMITSP in effect before 1 October 1979.

d/ Individual trainee population according to the PMITSP in effect after 1 October 1979.

e/ Some data are incomplete and population will exceed figure given.

Figure D-8

CATEGORY D -- ILLUSTRATION -- FORT STEWART

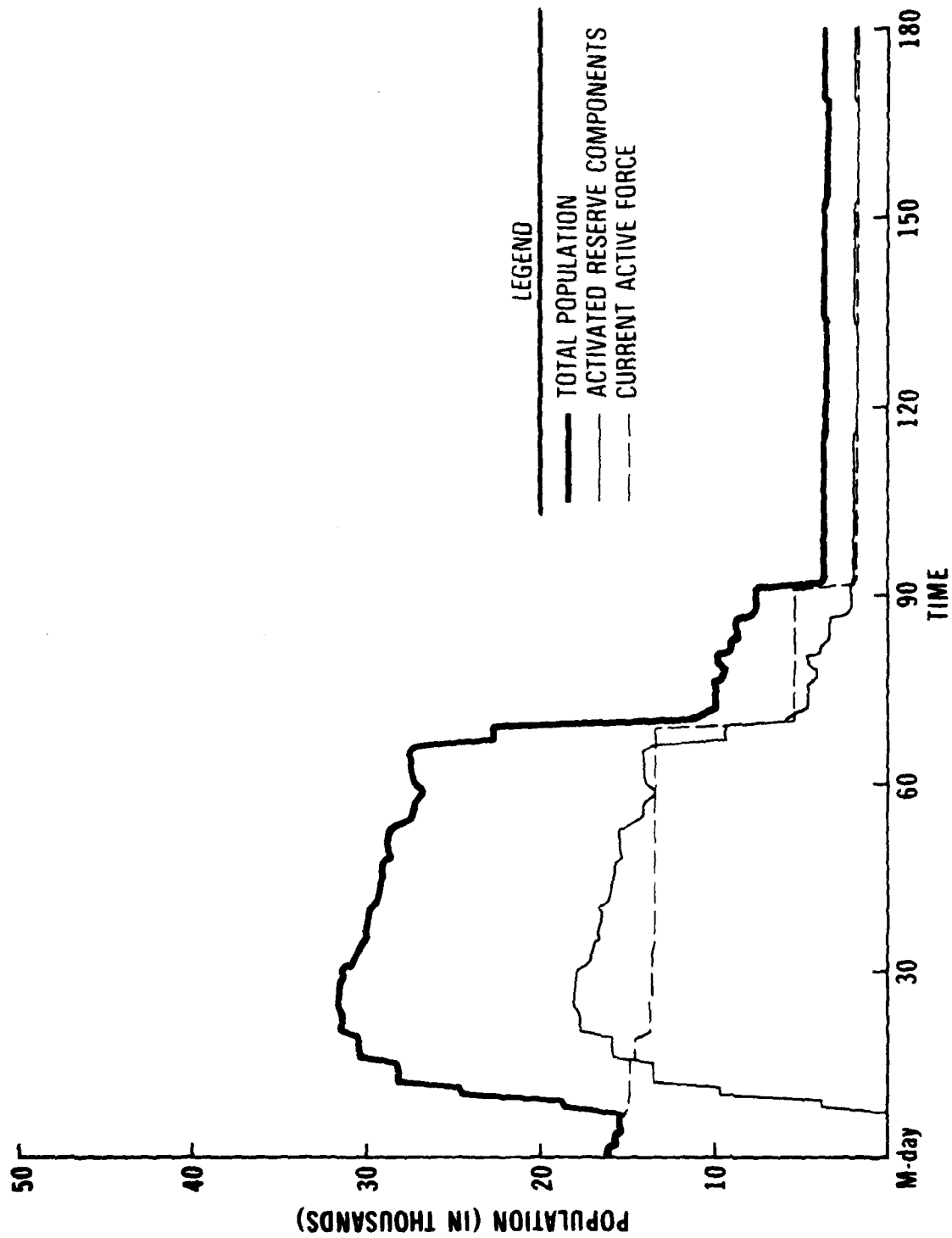


Figure D-9

CATEGORY D POSTS

	ASIP ^{a/} Strength Range	M-day Pop	Peak Pop ^{b/} (Thous)	% Growth	A ^{c/}	B ^{d/}
Ft Stewart	20-25	16	32	95	--	--
Ft Campbell	20-25	22	41	85	0	24
Ft Devens	5-75	7	24	233	.9	3
Ft Carson	20-25	20	25	24	--	--
Ft Meade	75-10	8	16	102	--	--
Ft Monmouth	1-3	1	7	399	0	.2

a/ DA, OCE, Army Stationing and Installation Plan: "Each installation has been assigned a master planning long range strength to facilitate planning. Facilities programming will be limited to the total installation strength shown."

b/ Based on the DA, USAFORSCOM, Mobilization Troop Basis Stationing Plan and coordinating the DA, TRADOC, Post Mobilization Individual Training and Support Plan in effect in the summer of 1979. The PMITSP was revised and republished in October 1979.

c/ Individual trainee population according to the PMITSP in effect before 1 October 1979.

d/ Individual trainee population according to the PMITSP in effect after 1 October 1979.

Figure D-10

CATEGORY E -- ILLUSTRATION -- FORT LEE

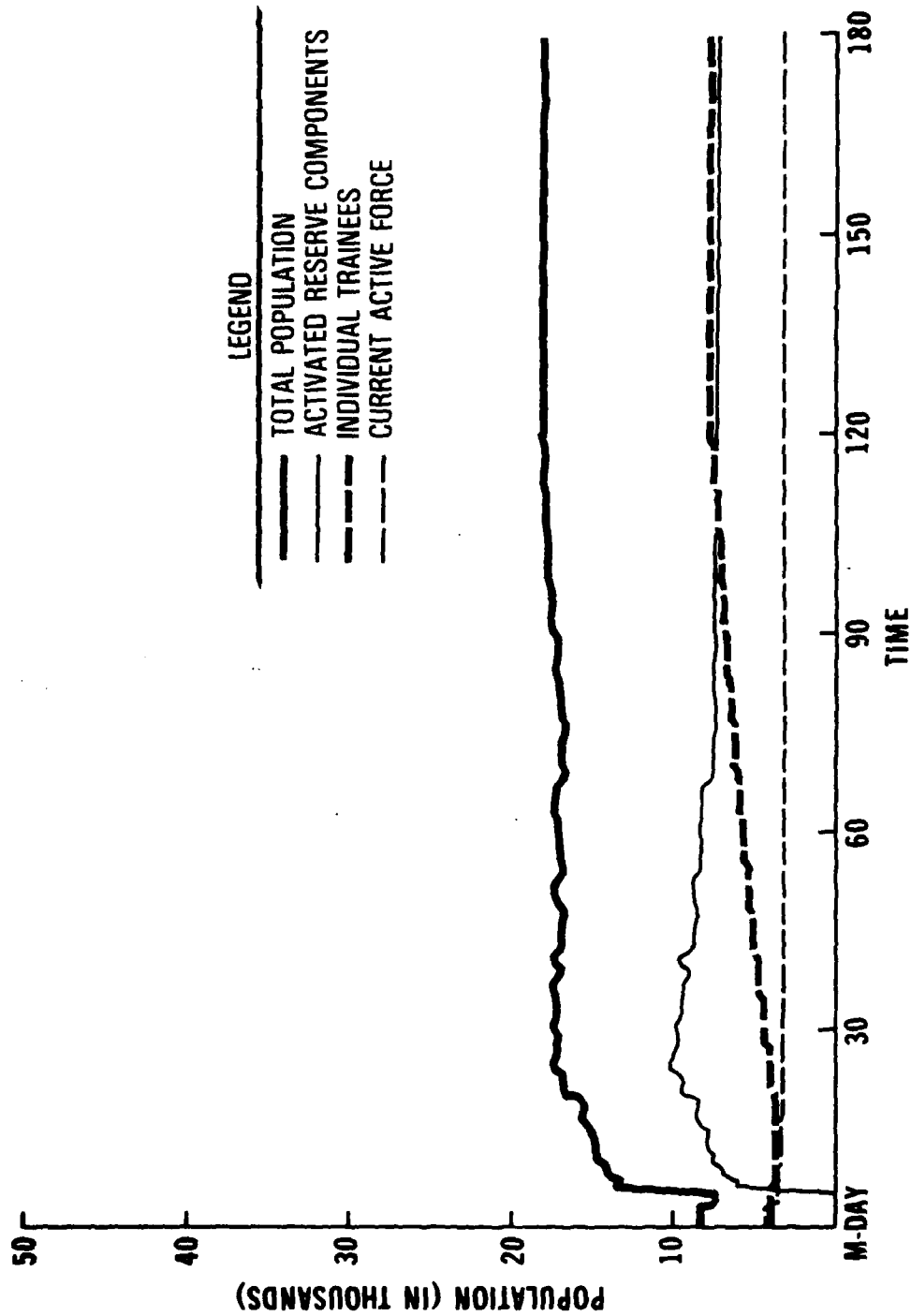


Figure D-11

CATEGORY E POSTS

	ASIP ^{a/} Strength Range	M-day Pop	Peak Pop ^{b/} (Thous)	% Growth	A ^{c/}	B ^{d/}
Ft Lee	7-10	8	18	122	8	8
Ft Rucker	7-10	8	17	112	8	8
Ft Sam Houston	10-15	8	18	125	?	?
Ft Benjamin Harrison	3-5	4	10	180	9	7

a/ DA, OCE, Army Stationing and Installation Plan: "Each installation has been assigned a master planning long range strength to facilitate planning. Facilities programming will be limited to the total installation strength shown."

b/ Based on the DA, USAFORSCOM, Mobilization Troop Basis Stationing Plan and coordinating the DA, TRADOC, Post Mobilization Individual Training and Support Plan in effect in the summer of 1979. The PMITSP was revised and republished in October 1979.

c/ Individual trainee population according to the PMITSP in effect before 1 October 1979.

d/ Individual trainee population according to the PMITSP in effect after 1 October 1979.

Figure D-12

CATEGORY F -- ILLUSTRATION -- FORT BRAGG

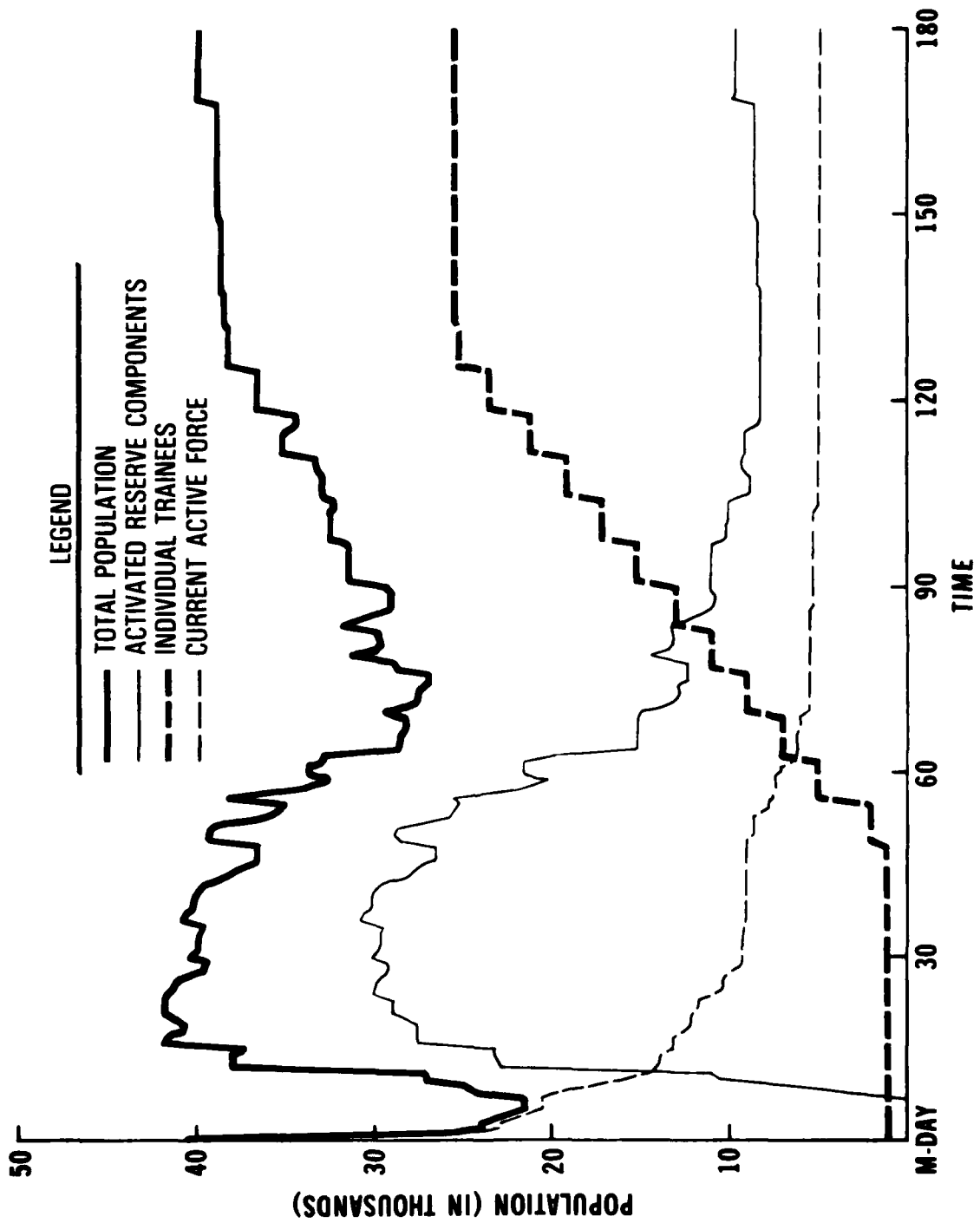


Figure D-13

CATEGORY F POSTS

	ASIP ^{a/} Strength Range	M-day Pop	Peak Pop ^{b/} (Thous)	% Growth	A ^{c/}	B ^{d/}
Ft Bragg	35-40	41	42	3	24	31
Ft Hood	45-50	48	52	8	34	34
Ft Lewis	20-25	23	26	16	19	27

a/ DA, OCE, Army Stationing and Installation Plan: "Each installation has been assigned a master planning long range strength to facilitate planning. Facilities programming will be limited to the total installation strength shown."

b/ Based on the DA, USAFORSCOM, Mobilization Troop Basis Stationing Plan and coordinating the DA, TRADOC, Post Mobilization Individual Training and Support Plan in effect in the summer of 1979. The PMITSP was revised and republished in October 1979.

c/ Individual trainee population according to the PMITSP in effect before 1 October 1979.

d/ Individual trainee population according to the PMITSP in effect after 1 October 1979.

Figure D-14

CATEGORY G -- ILLUSTRATION--FORT BELVOIR

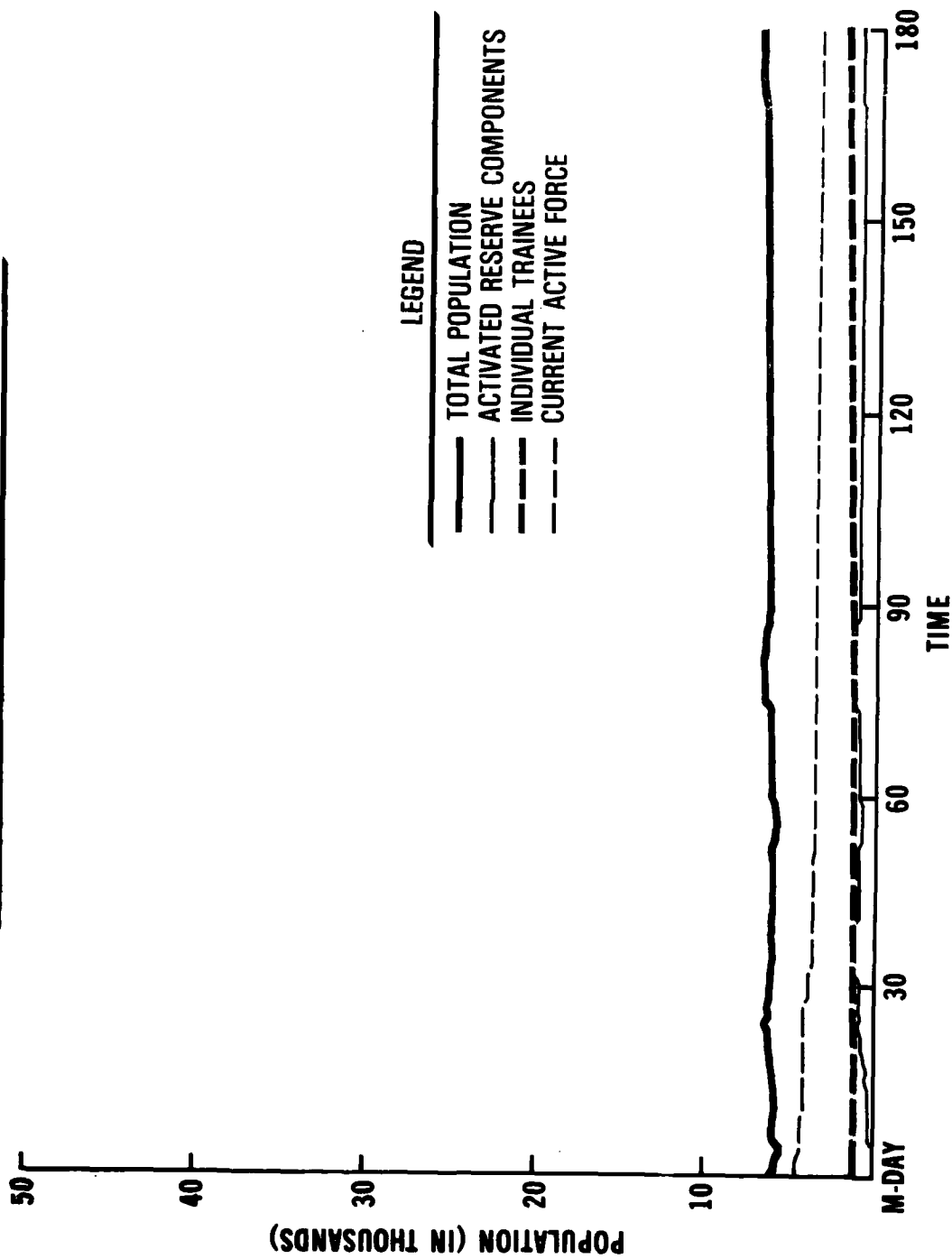


Figure D-15

CATEGORY G POSTS

	ASIP ^{a/} Strength Range	M-day Pop	Peak Pop ^{b/} (Thous)	% Growth	A ^{c/}	B ^{d/}
Ft Belvoir	5-7.5	6	7	21	2	2
Aberdeen PG	5-5.5	9	13	38	6	6
Ft Sill	20-25	22	28	30	20	14 ^{+e/}
Ft Riley	20-25	17	20	18	--	--
Ft McClellan	7.5-10	7	12	65	8	16
Ft Eustis	7.5-10	9	10	12	4	4
Ft Huachuca	5-7.5	6	7	15	.3	2
Ft Sheridan	1-3	2	4	92	--	--
Redstone Arsenal	3-5	3	5	36	5	2
Presidio of San Francisco	3-5	4	5	39	--	--
Ft Story	0-1	.2	1	537	--	--

a/ DA, OCE, Army Stationing and Installation Plan: "Each installation has been assigned a master planning long range strength to facilitate planning. Facilities programming will be limited to the total installation strength shown."

b/ Based on the DA, USAFORSCOM, Mobilization Troop Basis Stationing Plan and coordinating the DA, TRADOC, Post Mobilization Individual Training and Support Plan in effect in the summer of 1979. The PMITSP was revised and republished in October 1979.

c/ Individual trainee population according to the PMITSP in effect before 1 October 1979.

d/ Individual trainee population according to the PMITSP in effect after 1 October 1979.

e/ Some data are incomplete, and population will exceed figure given.

Figure D-16

CONUS installations. As a result, on many installations there is a population spike in the first 30-90 days of mobilization before these concurrent activities stabilize. Unfortunately, "quick-fix" construction efforts which can expand installation basic capacity to some extent generally are allocated 90 days for completion. The expanded capacity resulting from this effort may thus become available after the first population peak has passed. The second CONUS population peak, reflecting an increased buildup and creation of new units in a total mobilization, occurs over 2 years after M-day. Given proper planning, there is sufficient time to execute construction programs that realize an orderly expansion of installation capability to meet this peak. The following paragraphs present population curves and relevant data for seven categories of posts. Each category represents a group of mobilization installations with similar mobilization population profiles.

a. Category A (Camp Shelby). There is a group of mobilization posts that has little or no permanent peacetime personnel assigned, but which are mobilization stations for significant numbers of troops. Camp Shelby is typical of these posts. Figure D-3 presents Camp Shelby's population profile for 180 days after mobilization. Figure D-4 lists posts of the Camp Shelby type. These posts have mobilization population profiles with the same characteristics as Camp Shelby. Camp Shelby is interesting in that it was played in exercise Nifty Nugget in 1978 and was subsequently written up in the press.

Seen from one of the 50 mobilization bases that would have to spring into being should the nation carry out its plans to mobilize for a major war, Nifty Nugget was a disaster.

"This was one war we would have lost," concluded one officer of the 3397th U.S. Army Garrison, of Chattanooga, Tenn., a veteran whose recollection goes back to the mobilization for Korea.

"None of the Army mobilization stations tested during the exercise could support the mobilization activities of

reserve component units," states one Pentagon report. The report notes that after the regular Army units were theoretically sent to battle, the bases left behind functioned in "very limited" fashion because most of the people who knew how to run the bases had gone to war.

That was not the problem for the members of the 3397th U.S. Army Garrison. They were not sent to a regular military base. Their problem was how to breathe life into Camp Shelby, Miss., a swampy, mosquito-ridden camp 45 miles north of Biloxi, which had not been used by active units since World War II.

Because 14 such bases would have to be used during a real mobilization, the Army sent reserve units to three of them last fall to gear up for the pretended, all-out war in Europe.

Judging from the 3397th's still-classified "after action report," the mobilization at Camp Shelby was an operation that began on the wrong foot and went rapidly downhill.

The job of the 3397th was to prepare the base to receive five Army reserve brigades, tank units and mechanized infantry that in a real war would be coming from various parts of Tennessee to Camp Shelby to receive their ammunition and final training before being sent overseas.

The initial problem was an obvious one. The aging, but well-preserved wooden "temporary" buildings at the base would barely hold one 3,778-man brigade. Receiving five brigades would have turned the fields around the barracks into a sea of Army tents.

Tents. That meant using SAILS ("Standard Army Intermediate Level System"), a kind of computerized voucher system to locate and immediately reorder short supply items. Tents were just one of the 4,351 items the 3397th punched into SAILS.

Later the technicians learned that all of these requests had simply been canceled by the computer, which had not been programmed properly. "As it turned out they didn't have any tents anyway," explained an officer.

The 3397th didn't really need as many tents as they ordered because the reserve brigades theoretically coming to camp had over 4,000 vacancies. What was needed were tank crews and infantry-men to fill the tents so the base command turned to another computerized system, one called SIDPERS ("Standard Installation/Division Personnel System").

Actually there were three SIDPERS systems, one for the regular Army, one for the Army Reserve and one for the National Guard. Although they were different systems using different computer language, the Army had wired them all together for Nifty Nugget.

The problem was that they weren't wired together properly. The requests for the extra manpower went the way of the request for tents. The computer operators assumed that they, too, had been canceled, but that was wrong. A week later, after the 3397th began frantically going through the

paperwork necessary to turn the men from five vacancy-riddled brigades into two functionable ones, their computer request miraculously reappeared on their computer terminal screens. SIDPERS had found enough replacements to fill out one of the brigades. It was later discovered, though that 40 percent of this information was wrong.

Cannibalizing units was not a happy development at the base. "That isn't good at all," explained one officer. "It's better if these homefolks go as a unit. That's the way they've been trained."

It is difficult to see how the men would have been given their final training at Camp Shelby if the real units had showed up instead of just appearing as blips on the base computer.

There was no ammunition for the tanks and no place to store the diesel fuel they would need, but that was probably just as well because there were not even enough C rations available to fuel the drivers.

In fact, the officers of the 3397th could not imagine how the trains could get 300 flatcars carrying the units' big M60 tanks and hulking armored personnel carriers to Camp Shelby. There was only one decrepit rail line leading into the base. "That would have been the damndest train wreck you ever saw," was the way one officer put it.

The men of the 3397th had trouble telling the Army about their problems. Communications during a mobilization are supposed to be secret and for this purpose the Army had hauled in AUTODIN, a 12x12 foot computerized teletype system designed to send and receive messages in code.

While AUTODIN was being installed a technician noted that the teletype part of the machine didn't seem to work, but was told that the machine would be all right after "an initial adjustment and burn-in period." AUTODIN, though, never recovered from that initial adjustment. It was the first casualty of the simulated war.^{1/}

b. Category B (Fort Leonard Wood). Figure D-5 shows the population profile for Fort Leonard Wood which is typical of a group of posts that have a relatively stable Active Army population, an influx of Reserve components, and a steadily increasing trainee load for a steadily increasing total population. Figure D-6 lists posts with population profiles similar to Fort Leonard Wood.

c. Category C (Fort Ord). Figure D-7 shows Fort Ord's population profile. Fort Ord has an Active Army component which deploys early, an influx

^{1/} Fialka, "All Kinds of Foul-ups Hamper Army Mobilization," The Washington Star.

of Reserve components, and a steadily increasing training load after individual training is initiated. The resulting total population curve has an early peak within the first 30 days of mobilization, followed by a population trough, and then a second peaking which stabilizes at a high level. Figure D-8 lists posts with similar population curves.

d. Category D (Fort Stewart). Figure D-9 shows the population profile for Fort Stewart which has a late deploying Active Army component and early activated Reserve components that deploy by M+90. The total population curve has an early peak as both Reserve and active components are stationed on post, followed after M+90 by a greatly reduced population. Figure D-10 lists posts similar to Fort Stewart.

e. Category E posts. Figure D-11 shows the population profile for Fort Lee which has an Active Army population that remains very stable over the 180 days after mobilization, an influx of Reserve components, and a slow but steady growth in trainees. The total population curve rapidly increases and then stabilizes at a constant level. Figure D-12 lists posts with population curves similar to Fort Lee's.

f. Category F posts. Figure D-13 shows the population profile for Fort Bragg which has a large Active Army component that deploys rapidly, a large influx of Reserve components that also deploy rapidly, and a late starting but rapid growth in trainee load. The total population curve starts high, immediately dips into a trough, then rapidly climbs back to a second peak, declines again, and increases to a third peak as the trainee population grows. Figure D-14 lists posts with population curves similar to Fort Bragg's.

g. Category G posts. Figure D-15 shows that the population curves for Fort Belvoir experience no drastic variations. There is a slow steady

growth in total population which, in terms of numbers, is not as dramatic as at other post types. Figure D-16 lists posts with population curves similar to Fort Belvoir's.

h. Added to the troop installations cited above should be those installations belonging to the HSC and ACC. These installations, too, will undergo increased population loading in a mobilization and a determination of their capabilities is required. Corps support in enhancing such facilities to accommodate increased population and activity may be needed.

7. Summary. In determining Corps mobilization workloads for support of troop installations, it is essential that planners know the expected population loading for each post. While such loadings are not fully available as this study is completed, the ACE's Office should develop new population profiles for each installation when the data are complete. The profiles should then be transmitted to the Corps district planners in the responsible districts so that they will have the necessary population data as input to their installation support planning. Additionally, surveys of mobilization stations must be completed as soon as possible to identify asset deficiencies that would prevent any installation from supporting the population scheduled for it. These data also must be provided to district planners so that plans for overcoming deficiencies can be formulated. The planning must take account of the early-on population surges. Where deficiencies exist that would preclude an installation from supporting its early-on population surge, planning will have to be for expedient measures; there will not be time for major construction. With rapid response in mobilization as critical as it is, the problems experienced at Camp Shelby in the Nifty Nugget exercise cannot be permitted to occur in a real mobilization.

III. PRODUCTION BASE INSTALLATIONS

8. General. The full mobilization envisioned in planning will very rapidly place surging loads not only on troop stationing assets, but also on production, warehousing, and transportation assets. The majority of defense supplies will be produced by private industry, and the construction and maintenance management effort required is basically the responsibility of the corporation concerned. However, there are also government-owned production facilities whose peacetime existences are justified because the private sector does not have the capability, under mobilization conditions, of rapidly manufacturing the specific items produced at the government-owned facilities. Notable examples are the government-owned ammunition plants. There are 11 active plants, currently operating at partial capacity, which under full mobilization would convert to a full-capacity, 24-hour operation. There are 14 inactive plants, currently on a stand-by status, which under full mobilization could also go into full production. The trauma of converting to full production, especially from a mothball status, will surface significant maintenance and rehabilitation requirements at these plants. While more specific quantification of these requirements is desirable, it is not currently available. No planning data, such as called for in AR 210-23,^{2/} have been compiled for production base plants. Should mobilization decisions call for the construction of production facilities (such as a new tank turret foundry), either the manufacturing contractor or the Corps would be called on to be the construction manager. However, because such facilities would be constructed specifically for supporting mobilization, their location and

^{2/} DA, HQ, AR 210-2-23, Master Planning for Army Installations--Emergency Expansion Capability.

design criteria should be under Corps control and direction. Private industry, which is motivated by the profit incentive, cannot be expected on its own to develop additional production facilities that might have little or no peacetime payoff.

9. Identified Requirements. During the course of this study, DARCOM was asked to identify and locate the specific Corps support requirements needed for the production base in mobilization. While precise quantification of such support requirements is not possible without on-the-ground surveys, DARCOM has identified numerous facilities that would need extensive Corps support in a mobilization situation. Figure D-17 lists these facilities, the type of Corps service requested, and the responsible Corps district. Additionally, DARCOM has indicated that should a mobilization occur prior to FY 83, additional design and construction management support would be required at the Stratford Army Engine Plant in Stratford, Connecticut. As an immediate objective, DARCOM made two recommendations. The Corps should provide immediate assistance to DARCOM installations, addressing current facility conditions and developing alternatives to existing upgrading plans. Corps mobilization planning should provide for rapid upgrading of in-house and contract (architect and engineer (A&E) firms) expertise in the appropriate Corps districts for design of munitions facilities. Obviously, the military production base will need considerable Corps support, and this must be planned well in advance of any mobilization. Corps planners should initiate the necessary coordination and surveys now at DARCOM installations to ensure that data needed for plans are in hand and support plans are ready for immediate implementation.

IDENTIFIED PRODUCTION BASE SUPPORT

Facility	Type Service Needed				Responsible Corps District
	Planning	Survey	Design	Const Mgt	
<u>General</u>					
Aberdeen PG	X	--	X	X	Baltimore
Dugway PG ^{a/}	--	X	X	X	Sacramento
Jefferson PG ^{b/}	--	X	X	X	Omaha
Yuma PG	--	X	X	X	Sacramento
Army Ammo Plants	X	X	X	X	c/
Rock Island Arsenal	X	X	X	X	Omaha
Watervliet	X	X	X	X	New York
Fort Monmouth	X	X	X	X	New York
<u>Ammunition and General</u>					
<u>Supply Depots</u>					
Anniston ^{d/}	X	X	X	X	Fort Worth
Letterkenny	X	X	X	X	Baltimore
Lexington-Blue Grass ^{d/}	X	X	X	X	Baltimore
Pueblo ^{d/}	X	X	X	X	Omaha
Red River	X	X	X	X	Omaha
Sharpe	X	X	X	X	Sacramento
Tobyhanna	X	X	X	X	Baltimore
Tooele	X	X	X	X	Sacramento
New Cumberland	X	X	X	X	Baltimore
<u>Ammunition Storage^{e/}</u>					
Fort Wingate	X	X	X	X	Sacramento
Navajo	X	X	X	X	Sacramento
Savannah	X	X	X	X	Omaha
Seneca	X	X	X	X	New York
Umatilla	X	X	X	X	Sacramento

SOURCE: DA, DARCOM, 1st Ind, Study Advisory Group (SAG) Meeting Minutes, Corps Mobilization Study.

a/ Dugway Proving Grounds--survey roads, buildings, powerlines, sewerage systems, evaporation ponds, and building electrical systems.

b/ Jefferson Proving Grounds--environmental facility, calibration facility, x-ray facility, artillery building addition, rehabilitation of ammunition assembly buildings, various firing positions, miscellaneous roads, and surfaced area.

c/ See Figure 15 in the Main Paper.

d/ Requiring facility upgrade for both conventional and chemical munitions.

e/ Typical services that would be required are: upgrade of truck spotting facilities; upgrade of administrative space; improvement of receiving and shipping areas to include additional hardstands, lights, added power, and temporary shelters for outside processing and/or temporary storage; upgrade of container-handling facilities; and improvement of depot rail and road networks.

Figure D-17

IV. OVERVIEW

10. Installation Support. The most immediate Corps mobilization requirements appear to be at troop and production base installations. A wide variety of tasks would have to be accomplished, generally within the first 30 days of mobilization, if the installations are to meet capacity and production levels. To develop the plans necessary for accomplishing tasks expediently will require that Corps planners work closely with MACOM and installation commanders in surveying existing assets and determining deficiencies. In making these surveys and determinations, Corps planners need to be aware of the synergistic relationships of all installation assets. Additionally, the transport links to all installations need to be surveyed for adequacy to support the expected traffic over them. Road and rail links are often inadequate and would have to be immediately upgraded to meet mobilization traffic requirements. (This was demonstrated at Camp Shelby in Nifty Nugget and specified in DARCOM's assessment of support needs.) While specific requirements have not been quantified, and it may not be possible to quantify all requirements in advance of mobilization, the scope, type, and location of workloads should be ascertained and planned for as quickly as possible. Even with the requirements that have been identified at this time, the Corps mobilization workload appears to be very substantial.

ANNEX E

CONCEPTS FOR MOBILIZATION PLANNING

ANNEX E

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<u>Paragraph</u>		<u>Page</u>
1	Purpose	E-1
2	General	E-1
3	Operational Concept	E-1
4	Direction of Overall Planning Efforts by OCE	E-2
5	Division Planning	E-4
6	Lead District Planning	E-6
7	Support District Planning	E-8

1. Purpose. This annex presents the major planning considerations and guidance for Corps agencies in developing local mobilization plans.

2. General. Planning guidance discussed below is an extension of the mainstream analysis of this study toward improving the content of mobilization plans. The intent is to offer assistance in plan development by identifying principal elements for local analysis and solution, and not to dictate strict plan formats.

3. Operational Concept. Maintenance of the Corps' decentralized mode of operations is particularly important when mobilization actions are concerned because of the many rapid response requirements that must be satisfied to support our customers when military emergency situations develop. The basic concept to be promulgated is that the key players in both mobilization advance

planning and during execution will be the districts with major MC responsibilities. These MC districts will become the lead districts for all mobilization activities within their existing MC boundaries. Basically, these districts will provide "one-stop" service for all customers during a military emergency situation. It is envisioned that districts with only CW orientations will support the MC districts within their areas by providing response teams to meet mobilization requirements. CW districts may be given responsibility for entire projects, but the lead district concept will still prevail. Division activities will concentrate on facilitating coordination between districts within the division and also between their division and other divisions. Advance planning will reflect prior agreement to augment MC districts with appropriately constituted response teams from CW districts even though the CW districts are from other divisions. Direct coordination will be used to the maximum extent possible between lead districts and their support districts.

4. Direction of Overall Planning Efforts by OCE.

a. Priorities and schedules. Focus of Corps-wide efforts is to:

(1) Set general priorities for developing plans (i.e., address full mobilization first; total mobilization (conventional) as second priority; and total mobilization (nuclear) third).

(2) Develop overall schedule for completing and testing plans.

b. Guidance.

(1) Provide appropriate ERs and standard operating procedures to agencies (show availability dates for these references within schedules).

These references will contain policies, procedures, criteria, and other guidance regarding program development, funding controls, planning, execution, priorities, etc.

(2) Special assignments.

(a) Develop family of pre-engineered facility designs to facilitate rapid placement of selected features on installations in support of mobilization needs. These designs should be patterned conceptually after the Army Facilities Components System. Examples of these expedient facilities would include tent camps for billets; utilities, roads, and firing ranges; and other specialized training facilities. Use of readily available construction materials should be the major consideration in these designs. Site adaptation of these plans should be accomplished at district level given specific installation requirements.

(b) Develop initial and follow-on training courses to foster common understanding of mobilization elements and actions. This training should be geared to wartime procedures (not peacetime).

c. Resources.

(1) Allocate appropriate funding to Corps elements. Initially, MC districts will require higher funding levels than others.

(2) Identify target levels of internal effort to be expended by Corps elements to accomplish necessary planning.

d. Monitor and review.

(1) Monitor progress at appropriate stages of plan development-- indicate checkpoints on overall schedule.

(2) React to appropriate problem areas where headquarters solutions are involved (e.g., lack of commitment to advance mobilization planning on the part of potential customers, lack of sufficient tentage to effect expedient construction, or lack of sufficient communications capability either vertically or laterally).

e. Testing. Plan to conduct comprehensive internal tests to assess readiness to respond and the level of individual training and awareness with respect to mobilization actions. Maximum participation of key employees in these exercises should be one major objective. All Corps agencies should be included in testing exercises.

5. Division Planning.

a. Divisions with MC responsibilities. These divisions have the general responsibility for ensuring that Corps mobilization missions are properly addressed within advance planning efforts and that customer support is fully effective during a mobilization situation. Advance planning efforts must reflect:

(1) Decentralized mode of operations--focus on district "one-stop" service concept.

(2) Authorities that allow and encourage direct coordination among districts both internal and external to the division.

(3) Coordination with all potential customers resulting in viable statements of mobilization support requirements.

(4) Clear (and coordinated) statements of personnel and other support requirements assigned to support districts both internal and external to the division.

(5) Rationale for solving potential construction priority conflicts among customers, particularly when different commands or agencies are involved. (OCE guidance on this rationale should be applied consistently.)

(6) Appropriate communications networks commensurate with responsive support.

(7) Peacetime programs that address all facets of training needs.

(8) Coordination among all known affected Corps elements.

(9) Program development guidance, funds control, and reporting requirements under mobilization conditions.

(10) Utilization of division staff under mobilization conditions.

b. Divisions with districts having CW orientation only. These divisions are generally responsible for ensuring that requested support is provided to divisions and districts with MC responsibilities, and that effective peacetime training is pursued to ensure response to customers during a mobilization situation. Advance planning efforts must reflect:

(1) Full cooperation with divisions and districts with MC responsibilities in developing mobilization plans.

(2) Authorities that allow and encourage direct coordination among districts both internal and external to the division.

(3) Peacetime programs that address all facets of training needs.

(4) Appropriate communications networks commensurate with responsive support.

(5) Utilization of division staff under mobilization conditions.

6. Lead District Planning. These districts have the basic responsibility for advance planning, identifying, and quantifying all mobilization support missions, and for providing "one-stop" service to all customers within their geographic boundaries. Much initiative and effort is required to identify realistic levels of construction and other support needs for the established mobilization environments. This concern is offered because many customers will not have a clear assessment of their needs readily available for dissemination. In these cases, some analytic effort or review (hopefully to be accomplished in cooperation with customers) will be required to estimate support needs. Where little or no cooperation is experienced when dealing with customers, estimates for possible support needs must be generated by lead districts using all available intelligence references and experience. Lead districts must identify credible mobilization support requirements for customers; the Main Paper contains insights on how to approach the ultimate solution to this problem.

a. Workload identification. As districts commence advance planning efforts, the importance of maintaining proper focus cannot be overstressed. It is intended that the full mobilization situation be addressed as first priority, followed by total mobilization (conventional), and lastly by total mobilization (nuclear). When specific requirements are identified in cooperation with the many customers, it will be necessary to relate these to appropriate construction projects (or facilities) and other quantified mobilization support tasks. Immediate consideration should be given to how these requirements would be satisfied on mobilization. To do this, there is a need for a clear understanding of the beneficial occupancy date (BOD) for each

project or the timing for other types of support (e.g., leasing, FE augmentation). Also, with regard to each project, there must be a determination as to the use of standard pre-engineered designs if unique plans need to be developed.

b. Capability assessment. Estimates must be developed that reflect the levels of in-house Corps personnel needed to accomplish the identified workload. District support capabilities will be identified and coordinated with these affected CW districts. Tasks that are to be accomplished by support divisions should be coordinated to the maximum extent possible so that necessary internal planning can parallel the lead district's mobilization plans.

c. Training program. Given the specific workloads identified and other likely missions, a training program can be structured for selected individuals who would serve as key people during mobilization situations. Such a training program must be developed to cross-train personnel in their likely mobilization positions--this training should focus on policies and procedures to be used during a mobilization. Since many CW personnel would become involved with supporting emergency missions, there should be as much background and general military information as is practical provided to raise their awareness.

d. Execution planning. As various projects are identified, the likely method for accomplishing this work should be identified. In this regard, the district mobilization plan should identify local contractor capabilities, by regions, and some rosters should be developed and maintained to allow rapid contact of these selected contractors. Certain construction will require materials that are not readily available; efforts should be

directed to identifying these items and sources where they could be purchased. Alternative materials should be considered in the cases where some materials are known to be unavailable within the lead times following M-day. If this is not feasible, then the problem must be surfaced and resolved with the customer or within the Corps.

e. Communications. To provide responsive support, Corps elements must have appropriate communication links, both vertically and laterally. Advance mobilization planning must include the identification of these communication needs, and recommendations must be made to higher headquarters to overcome shortfalls. Peacetime enhancements of the system must be put into place if support is to be effective.

f. Security. Mobilization plans must also address security measures to be taken for protection of Corps-operated facilities and equipment. These measures should reflect actions for preventing sabotage of key facilities and equipment (e.g., dams, locks, hydropower stations, water supply reservoirs, major pumping stations, and floating equipment).

7. Support District Planning. Districts with only CW orientation will provide direct support to lead districts during a mobilization situation. Advance planning efforts by lead districts will identify both specific and general tasks and other types of support which are to be provided by support districts. These support tasks will be described to the extent possible. Advance planning efforts by support districts must reflect:

a. Full cooperation with district with MC responsibilities in development of mobilization plans.

b. Peacetime programs that address all facets of training needs predicated on mobilization support.

c. Appropriate communication networks commensurate with responsive support.

d. Internal security measures (see paragraph 6f above).

e. Communications. To provide responsive support, Corps elements must have appropriate communication links, both vertically and laterally. Advance mobilization planning must include the identification of these communication needs, and recommendations must be made to higher headquarters to overcome shortfalls. Peacetime enhancements of the system are to be put into place if support is to be effective.

ANNEX F

BIBLIOGRAPHY

ANNEX F

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